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The Moderating Effect of Intraoffice Group Dynamics on the Ambulation of SMS-Prompted Utah Tech Professionals

David Collins Moore
Utah State University

THE MODERATING EFFECT OF INTRAOFFICE GROUP DYNAMICS ON THE AMBULATION OF SMS-PROMPTED UTAH TECH PROFESSIONALS

by

David Collins Moore

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Approved:

Kristy Bloxham, Ph.D. Major Professor	Jody Clarke-Midura, Ed.D. Committee Member
Kristin Searle, Ph.D. Committee Member	D. Richard Cutler, Ph.D. Interim Vice Provost of Graduate Studies

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ABSTRACT

The Moderating Effect of Intraoffice Group Dynamics on the Ambulation of SMS-Prompted Utah Tech Professionals

by

David Collins Moore, Master of Science

Utah State University, 2021

Major Professor: Dr. Kristy Bloxham, Ph.D.
Department: Instructional Technology and Learning Sciences

This mixed methods quasi-experimental research examined the extent to which group membership moderates the impact of short message service (SMS) activity prompts on daily step count. Two 17-member convenience samples were recruited from various software companies in Utah. The participants in the cohesive group unit sample worked together in a single office, while the lone participants were recruited from and worked in separate offices. All participants were given digital wristband pedometers to monitor their walking habits Monday through Friday throughout the 6-week experiment. Participants' daily step count baselines were established during the initial two weeks of the experiment, and for the following four weeks they were sent text message activity prompts twice per workweek day.

Step count data were analyzed through an a priori linear contrast (p = .022), a 2x6 mixed design ANOVA (group membership by weeks, p = .042), and a 2x2 mixed design

ANOVA (prompt by group membership, $p = .073$). Postintervention interviews and surveys were administered and analyzed to gauge self-assessed treatment efficacy and to identify additional relevant themes. Quantitative and qualitative evidence was found that suggests cohesive group unit membership positively moderates the impact of persuasive technology on physical activity. These findings suggest that office-based exercise programs utilizing persuasive technology in conjunction with group membership may be more effective than approaches without a social component.

(244 pages)

PUBLIC ABSTRACT

The Moderating Effect of Intraoffice Group Dynamics on the Ambulation of SMS-Prompted Utah Tech Professionals

David Collins Moore

This research examined the extent to which group membership affects the impact of text message activity prompts on daily step count. Two 17-member convenience samples were recruited from various software companies in Utah. The participants in the cohesive group unit sample worked in close proximity to one another in a single office, while the lone participants were recruited from and worked in separate offices. Participants' daily step count baselines were established during the initial 2 weeks of the experiment, after which they were sent text message activity prompts twice per workweek day for the remaining 4 weeks. Step count data were monitored using digital wristband pedometers.

Statistical analyses, interviews, and surveys were conducted after the experiment was completed, and evidence supporting the idea that group membership increases the effectiveness of persuasive technology was found. These findings suggest office-based exercise programs utilizing persuasive technology in conjunction with group membership may be more effective than approaches without a social component.

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Last, I would like to thank my wife, Juliet, for absolutely everything. There are no words I can assemble to adequately summarize how exceptionally you have assisted me in this journey, both emotionally and intellectually. As I metaphorically bashed my head against and eventually through this brick wall of an experience, your laughter and love kept me (mostly) sane. I very much look forward to conversing with you about *anything else*.

Put simply, I could not have done this without each of you. Thank you all.

David Collins Moore

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CHAPTER I

INTRODUCTION

The Centers for Disease Control (CDC, 2016) defines overweight as having a body mass index (BMI) of greater than 25.0, and obesity as having a BMI of greater than 30.0. Sedentary behavior and physical inactivity both significantly contribute to overweight and obesity and are associated with their own health risks. Sedentary behavior is "any waking behavior with an energy expenditure of ≤1.5 METs, while in a sitting or reclining posture," while physical inactivity is a lack of sufficient exercise (González et al., 2017, p. 112). Obesity is a particularly notable problem in the USA, with roughly one third of men and women exhibiting the condition (Ng et al., 2014). Overweight is associated with all-cause mortality (Berrington de Gonzalez et al., 2010).

Measures have been taken to address this weight epidemic. One approach to encouraging healthy levels of physical activity is through the use of technology-based motivational tools. For example, daily mobile phone app notifications have been shown to improve exercise and eating habits (Kuo, 2017). Persuasive technologies utilizing behavioral prompts or immediate rewards have been shown to decrease sedentary behavior (Bond et al., 2014) and increase healthy habits (Mummah et al., 2017). Despite potentially possessing numerous features that should increase their effectiveness as motivational tools, activity tracking software routinely fail to outperform traditional pedometers in improving exercise habits (Dunn & Robertson-Wilson, 2018). This may be explained by the Fogg Behavior Model (FBM), which posits that triggers—situation-specific prompts—in conjunction with motivation and ability, are requisites for

modifying an individual's behavior (Fogg, 2009). Additionally, situated learning theory describes learning as a shared event experienced in real-life situations among communities of practice (Lave & Wenger, 1991). FBM and situated learning may provide the frameworks necessary for successfully implementing technology-based behavior modification.

A review of the existing relevant literature indicates opportunities for improvement and additional investigation. A majority of the previous research on wearable activity trackers has not investigated the effect of time- or situation-specific prompts on physical fitness. Additionally, the current literature does not address the impact of group dynamics on exercise-centric persuasive technology. Prior studies have also had methodological issues, including an over-reliance on self-reporting measures to assess activity tracker effectiveness, a failure to screen participants based on desire to exercise, and sampling methods that ignored potentially relevant demographic factors. For these reasons, additional research is needed to determine the efficacy of technological prompts (e.g., SMS messages) and cohesive social group dynamics on exercise habits.

The benefits of this line of research include increased knowledge about the impact of complimentary treatments—such as SMS messaging and activity tracking—when used in a group setting. The findings from this research can be used to inform the development of more effective fitness interventions. The research project employed a mixed-factorial design to investigate the possible compounding effect of cohesive group involvement on SMS message activity prompts sent to Utah tech employees between the ages of 25 and 45, using step count as the outcome variable. A treatment group participated in the study

as cohesive units of coworkers and a control group participated in the study as lone members. Both the control and treatment groups had their behavior monitored by wearable fitness trackers and received SMS activity prompts at 11:30 a.m. and 2:30 p.m. on each weekday throughout the study.

The research question that guided this study was:

1. Do intraoffice group dynamics moderate the effect of SMS activity prompts on the walking habits of young Utah tech workers?

CHAPTER II

THEORETICAL FOUNDATIONS AND LITERATURE REVIEW PLAN

Theoretical Foundations

The FBM and situated learning theory provide the theoretical foundations for the pursuit of evidence relevant to the aforementioned research question.

Fogg Behavior Model

Fogg's (2009) theory of behavior modification suggests that behavioral changes are the result of the presence of three factors: ability, motivation, and a trigger. In order for a target behavior to occur, the individual must be triggered when above the behavior activation threshold—that is, when they are simultaneously sufficiently motivated and sufficiently able to perform the task. A trigger is any event that indicates the behavior should be performed, such as an alarm, a reminder, or a prompt. Triggers may be intentional or happenstance, and may be internal or external to the individual. When an effective trigger occurs while the individual is above the behavior activation threshold, the target behavior is emulated. Successful persuasive technology attempts to increase motivation, decrease task complexity, and intentionally deliver well-timed triggers (Fogg, 2009).

Situated Learning Theory

Lave and Wenger (1991) describe situated learning as a fundamentally social process that occurs in a real-world setting. This learning, initially understood through the

lens of apprenticeship, occurs within a functional group known as a community of practice. Community members acquire new knowledge, skills, and behaviors through participation in the group, and the community as a whole is continually engaged in the co-construction of understanding regarding activities, artifacts, and identities related to the group's function (Lave & Wenger, 1991). The practices of the group and its members are embedded in a specific social and physical environment, meaning the setting where behaviors are modified is the same as where those behaviors are applied. According to situated learning theory, community and context are both critical factors in the acquisition of new behaviors.

This suggests that group membership may positively impact the efficacy of technological interventions designed to modify behaviors. A key tenet of situated learning theory is that learned behaviors are acquired in complex, highly social environments. Proponents of this theory claim that behavioral modification through learning is most effective when that modification occurs within a group—a practice known as cooperative learning or group learning (Anderson et al., 1996). This claim suggests that persuasive technology designed to modify behavior may be more effective when applied in a group setting.

Group membership may also positively impact physical fitness and adherence to exercise programs. Experiments have shown that cooperative exercise can improve social bonding, and social bonding in turn can lead to improved exercise abilities (Davis et al, 2015). This provides additional evidence suggesting that group membership might improve a technological intervention designed to increase physical fitness.

Literature Review Plan

Technological triggers delivered in cohesive group contexts may be an effective way of modifying behavior. Interventions that employ the use of SMS messages and applications on mobile phones have led to positive changes in BMI and weight-loss but have not significantly increased physical activity when compared to traditional interventions (Flores Mateo et al., 2015). However, users have reported particularly enjoying the prompting feature of physical fitness mobile phone applications, reporting that feedback significantly increased their motivation to exercise (Payne et al., 2015). A systematic review of the research literature was necessary to explore factors impacting the efficacy of persuasive technology and to determine the next step in this line of research.

Literature Review Objectives

The objectives for this literature review were as follows.

- To describe the current state of the research on behavior modification techniques that utilize mobile or wearable technologies in conjunction with group dynamics to introduce or strengthen a desired behavior such as physical activity.
- To discuss the issues, strengths, and weaknesses in previous research.
- To draw conclusions based on this information from which the research questions and strategy for this study will be formulated.

Search Procedures

In order to locate studies on technology-based behavior modification, the

following databases and search engines were used to locate articles published between 2007 and 2018:

- Google Scholar
- EBSCOhost
- PsycINFO
- PsycARTICLES
- Psychology and Behavioral Sciences Collection
- ERIC
- Education Source
- PubMed
- CAM Index on PubMed
- Health Source: Nursing Academic
- Alt-HealthWatch

A variety of search terms were used both singularly and in combination, including the following.

- persuasive technology
- behavior modification
- group motivation factors
- exercise
- physical activity
- health
- opportunistic exercise
- motivating games
- rewards
- notifications
- wearables
- quantified self
- app usage

Inclusion and Exclusion Criteria

Articles that were included in this systematic literature review met the following criteria.

- The study was a peer-reviewed primary source

- It was an empirical study published between 2007 and 2018
- The study focused on technology-based notification mediums (e.g., SMS messages or mobile push notifications), frequency of notification delivery, language and tone of notification, and notification type (e.g., reminders or rewards)
- The target outcomes included new or improved habits or routines in the research participant
- The target population was over the age of 18.

CHAPTER III

REVIEW DISCUSSION

A systematic review of the literature was conducted, and ten articles were analyzed and compiled in a coding table spreadsheet for reference. Information was collated into three categories, including sample characteristics, research design characteristics, and research outcomes/conclusions. Tracked data included sample size, age range, sex, BMI, sampling techniques, research design, measures, results, and conclusions. This section will outline the results of this systematic review.

Sample Characteristics

Sample size

Four of the 10 studies had larger sample sizes, with between 90 and 139 participants. Two of the studies had 56 to 77 participants. The remaining four studies had smaller groups, with between 20 and 35 participants. Further research should include a sample size of at least 30 participants to ensure continued accuracy in findings.

Age

The majority of the reviewed articles studied a wide range of ages, between 18 and 71. Two articles studied a smaller range that skewed younger, between 18 and 31, with mean age in the early twenties. One of the articles studied an older group, with participants averaging age 69. Future studies should focus on specific age ranges to isolate potential differences in age groups.

Sex

Four of the studies' samples were half male and half female. Three were approximately two-thirds female. Three of the studies had samples that were over 80% female. In future studies, an equal number of males and females is ideal.

Desire to Exercise More

One of the reviewed studies recruited participants exclusively from a weight-loss program, so it is reasonable to assume that the entire sample wanted to lose weight. Two studies had samples with a percentage of participants that were seeking weight loss: 20% and 50%, respectively. Seven of the studies did not include information on the desire of their participants to lose weight. This information is essential to include in future research.

Research Design Characteristics

Research Design

All reviewed articles were empirical studies. The use of experiments to produce evidential data is effective and desirable for this research endeavor. Future studies should continue to utilize experiments.

Sampling Technique

All reviewed previous studies have utilized nonprobability sampling in selecting their participants. Most studies used on-campus or in-fitness center recruitment techniques. One study used a market research firm to recruit participants. Another study

recruited from a weight-loss program. One study recruited students from a specific college course. Future studies should screen candidates based on degree of motivation to improve fitness.

Data Collection Technique

The 10 reviewed studies utilized a combination of surveys, app or activity tracker data, and physical fitness assessments to gauge changes in their sample populations. Surveys employed included the International Physical Activity Questionnaire (IPAQ), Outcome Expectations for Exercise (OEE), General Self-Efficacy, and Well-being (PERMA). Other surveys included statements assessed by participants using a five-point Likert scale. Two of the studies used surveys exclusively. One used a survey along with a physical fitness assessment. Three of the studies used apps or activity tracker data alone, and four used tracking data in conjunction with a survey. Surveys are useful for exploratory research, but self-assessment is prone to error. Further research should focus on quantitative data from activity trackers in order to objectively determine the effects of persuasive technology on exercise habits.

Dependent Variable

The 10 studies measured the effects of various forms of technology on physical activity, healthy eating habits, and attitudes regarding exercise and fitness. Six of the studies measured physical activity, most of those specifically measured step count. Two of the studies measured self-assessed eating habits, and two measured participants' attitudes toward exercise, including self-efficacy and expectations. Future research

should isolate physical activity as a dependent variable.

Independent Variable(s)

Most of the reviewed studies investigated multi-faceted mobile phone app-based interventions. In one case, the app was accompanied by a Fitbit. In another, the app was accompanied by a website and activity program. In two of the studies, the type of messaging varied. One of the message variation studies showed the control group the health benefits associated with behavioral changes and the treatment group the health benefits along with the environmental impact of their healthy actions. In another study on message variation the notifications were framed in terms of weight loss in the control group and framed in terms of health improvement in the treatment group. Most of the studies used on-screen messaging, but others used audible alerts. None of the studies mentioned group dynamics as a potential compounding factor. Future studies should continue to investigate mobile phone-based interventions, but facets of the intervention such as messaging should be isolated or studied individually. Additionally, future studies should address the potential for group interaction to influence behavior modification through persuasive technology.

Threats to Internal and External Validity

Most of the studies that were reviewed selected samples that were largely female. The interfaces and messaging being studied were overly complex, making broad application of the results unreliable. Also, many studies used participant self-assessment as a measurement of treatment efficacy. To improve accuracy, future studies should

evaluate efficacy based on wearable activity trackers rather than self-assessments. Additionally, future research should study both males and females, focus on a specific age group, and utilize simpler interfaces and messaging.

Research Outcomes

The current research suggests that technological interventions can be effective for measuring activity and for positively modifying exercise and eating habits. Popular app-based activity trackers accurately count steps, especially among users with typical gaits (Kuo, 2017). This makes them an effective measurement of general levels of physical activity for most people. In addition to their accuracy, technological interventions can be effective at modifying behavior. Fitbit ownership has been shown to increase physical activity among college students (Rote, 2017). Elderly people increased their physical activity when using an app-based activity tracker (Steinert et al., 2018). Audible and on-screen prompts have decreased sedentary behavior among overweight and obese adults (Bond et al., 2014). A robust internet- and phone-based activity plan has been shown to increase and maintain physical activity in adults (Hurling et al., 2007).

Regarding what aspects of these technological triggers cause changes in behavior, it is clear that the type and timing of the messaging is related to effectiveness. Messaging that is gain-framed, or emphasizes potential benefits of an activity, is more effective than loss-framed messaging (Lim & Noh, 2017). Prompts that occur at specific, appropriate times, such as right before the user goes to bed, have also been shown to be effective (Mummah et al., 2017). Audible and screen-based prompts triggered by the user's

sedentary behavior have been effective at increasing activity (Bond et al., 2014).

Conclusions

Although there is evidence that shows activity tracking software accompanied by technological prompts is effective at increasing physical activity, it's difficult to say which parts of an overly complex intervention are affecting change, or why some technological interventions are no more effective than more traditional approaches. Isolating variables and exploring new approaches will yield a better understanding of what factors impact treatment efficacy. Previous research has investigated the effects of persuasive technology on individuals. New research should study the compounding effects of group dynamics on persuasive technology. Previous research has used samples that have wide age ranges and are mostly female. Future studies should recruit an equal number of male and female participants from a specific age group and. Previous research has used self-assessment to measure changes in physical activity. The proposed study will use objective measurements to assess changes in the sample population's physical activity. Previous research has neglected to screen participants based on their desire to exercise more. Future research should include this protocol.

CHAPTER IV

METHOD AND DATA ANALYSIS

Research Design

The purpose of this study was to examine the possible compounding effects of cohesive group dynamics when combined with technological triggers (i.e., SMS message prompts) on the number of steps taken by Utah tech professionals between the ages of 25 and 45 who expressed interest in being more physically active. This quasi-experimental study employed a mixed design, including both a between-subjects component (cohesive unit participation or lone member participation) and a within-subjects component (time over six 1-week intervals).

Participants

A convenience sample of 34 Utah tech professionals was recruited for this study. The cohesive unit participant groups were recruited from a single Utah tech office, and the lone participants were recruited on an individual basis. The cohesive unit participant groups were comprised of coworkers on two teams (i.e., the Product team and the Engineering team) within one office. Cohesive unit participants were expected to work in close proximity to one another. Lone participants were all recruited from separate offices and were not expected to work with other participants. There were two cohesive unit groups of eight and ten participants respectively. The lone participant group consisted of 17 individual participants. Recruitment was conducted by phone, email, via Slack, and in

person. Inclusion criteria for this study was self-assessed desire to increase physical fitness, ownership of an iOS or Android smartphone, full-time employment at a Utah tech company, and being between the ages of 25 and 45.

Variables

All participants wore Fitbits for the duration of the 6-week study. For the first 2 weeks, participants were monitored without intervention to establish a daily step count baseline. For the remaining 4 weeks of the study at 11:30 a.m. and 2:30 p.m. Monday through Friday all participants received SMS messages prompting them to be physically active (see Appendix A). The total number of steps taken during each of the 6 workweeks (Monday through Friday) functioned as the dependent variable. The independent within-subjects variable was the number of weeks (time = 1, 2, 3, 4, 5, 6). The independent between-subjects variable was cohesive group unit membership (whether the participants were working together in an office with other participants or participating individually as lone members).

Materials

Recruitment Materials

Recruitment emails, Slack messages, and texts were sent to various tech employees in Utah. Recruitment phone calls were also made.

Informed Consent Form

Informed consent forms (see Appendix B) were given to the participants before

the study began. The forms provided participants with full disclosure regarding the nature of the study, study procedures, and the risks and benefits associated with participation. Participants were told consent would be voluntary in nature and that they could leave the study at any time without penalty.

Data Collection

Participants filled out an initial intake form indicating their phone number, sex, ethnicity, and age (see Appendix C). First generation (circa 2015) Fitbit Flex Wireless Wristband Bracelet wearable activity trackers were provided to the participants. The Fitbits monitored the number of steps taken by each participant Monday through Friday for the duration of the study. The Fitbit app was installed on each participant's phone, and step count data were automatically synced via Bluetooth from the device and the app to online Fitbit accounts created for the study. Excluding IP address, the participants' personally identifiable information was not associated with these accounts. Step count data from the anonymized accounts were manually entered into a spreadsheet on a daily basis for later analysis. After the six weeks of monitoring were complete, three lone participants and three cohesive unit participants were interviewed about their experiences, the effectiveness of the treatment, and potential mitigating factors (see Appendix D). The other participants were asked the same questions in an exit survey. All responses were recorded, transcribed, and coded as data units in a spreadsheet for later analysis.

Software

The Fitbit app's activity tracking software was used to monitor participants' steps. The automated SMS message software SimpleTexting was used to send scheduled motivational SMS messages (see Appendix A) to the participants' smartphones each weekday at 11:30 a.m. and 2:30 p.m. for the last four weeks of the study.

Hardware

Each participant was given a Fitbit Flex One, which was used to track their physical activity on weekdays throughout the study. Each participant was required to own an iOS or Android smartphone that could be paired with their Fitbit Flex One.

Procedures

After IRB approval from Utah State University was received and other appropriate protocols were completed, recruitment efforts occurred. Emails, text messages, Slack messages, and phone calls were used to contact potential participants. Interested participants were given an informed consent form describing the objectives and methods of the study (see Appendix B). After consent was provided, 34 participants were enrolled based on the following inclusion criteria: a self-assessed desire to increase physical activity, ownership of a cellular mobile device, age between 25 and 45, and current full-time employment at a Utah tech company (see Appendix E). Half of the participants were recruited as two cohesive units within a single office (the treatment group), and the other half participated individually as lone members (the control group). Participants filled out an initial intake form indicating their age, sex, ethnicity, and phone

number (see Appendix C). All participants had the Fitbit app installed on their phones and were logged in with an anonymized account created for the purpose of this study. The Fitbit "goal" setting was increased to maximum to eliminate feedback from the device regarding goal completion, and participants were asked not to open or interact with the Fitbit application. Automatic syncing via Bluetooth was enabled within the application. Participants whose Fitbits failed to sync for longer than 24 hours were contacted for troubleshooting.

The study was conducted over the course of 6 weeks. Participants' daily step counts were tracked Monday through Friday. For the first 2 weeks (baseline establishment), no SMS messages were sent to the participants. For the remaining 4 weeks (intervention), all participants received SMS messages each weekday at 11:30 a.m. and 2:30 p.m. prompting them to be physically active (see Appendix A). After the 6th week, moderated exit interviews were conducted with three lone participants and three cohesive unit participants. They were asked about their experiences, the treatment's effectiveness, and potential mitigating factors (see Appendix D). The participants who were not interviewed were given an exit survey with the same questions.

Data Analysis

Collecting step data through the activity tracker allowed for assessment of the extent to which SMS triggers compounded by group dynamics impacted exercise in Utah tech professionals who expressed interest in becoming more physically active. Descriptive statistics for number of steps at each week for the two groups were

computed. Person-profile plots and means plots showed the change in the outcome variable of daily step count over time by group. A mixed design ANOVA modeled the outcome of number of steps taken by each participant and assessed the statistical significance of any interaction between time and group membership (cohesive units vs. lone members). An a priori planned linear contrast statement comparing the two baseline weeks to the subsequent four weeks while receiving the prompts assessed the moderating effect of group dynamics. A significant interaction was found, and post hoc comparisons controlled using Šidák's method were utilized and displayed with plots of the estimated marginal means and their confidence intervals. All analysis was conducted in R 3.6.0 (R core Team, 2019) and the '*afex'* package (Singmann et al., 2019) and a significance level of .05 (alpha) was utilized.

Collecting feedback from lone participants and cohesive group unit participants in postexperimental surveys and interviews allowed for exploration of possible factors influencing the success or failure of the intervention. Qualitative analysis was conducted utilizing methods described by Chi (1997). Responses to the interview questions were coded into data units, analyzed for patterns, and developed into themes. Themes were quantified and summarized, and corresponding representative quotations were reported.

CHAPTER V

FINDINGS

Quantitative Findings

Collecting step data through the activity tracker allowed for assessment of the extent to which SMS triggers compounded by group dynamics impacted exercise in Utah tech professionals who expressed interest in becoming more physically active. Although single value subject weekly mean imputation was used to replace daily step counts of zero, no protocol was established in the proposal for addressing near-zero daily step counts. To address this unforeseen complication, which may be indicative of incomplete data, the statistical analyses utilize imputation of data below a minimum threshold of 500 steps per day unless otherwise stated, and a sensitivity analysis was conducted to gauge the impact of various thresholds on significance (see pp. 29-30). The descriptive statistics reported do not utilize imputation, and include all non-zero step count data.

Descriptive Statistics

Median, mean, and standard deviation of daily step count were computed for each week of the experiment as well as for baseline weeks and intervention weeks in aggregate. These statistics were segmented by participant type—lone participants (control) and group member participants (treatment). Comparing baseline to intervention for each participant pool provides evidence indicating that group membership positively moderates the relationship between activity prompts and step count. Note that daily step count as a measurement has a lower limit of zero. Positive skewness was anticipated and

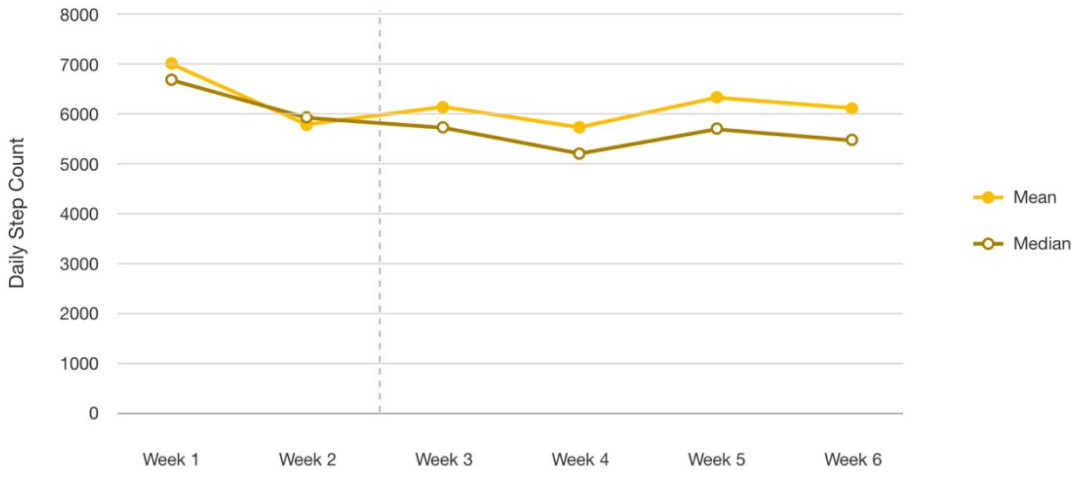
was present, making median a better measurement of central tendency than mean for these data.

Descriptive statistics of lone participants' daily step counts for individual weeks (see Figure 1) and comparing baseline establishment weeks to intervention weeks (see Figure 2) shows a generally downward trend, where mean and median of daily step count decreased from baseline to intervention. During the baseline establishment weeks, median step count for lone participants was 6314 (M = 6,442, SD = 3,244), and ranged from 226 to 16,580. During the intervention weeks, median step count for lone members decreased to 5598 (M = 6,059, SD = 3,700), and ranged from 9 to 26,601.

Descriptive statistics of group members' daily step counts for individual weeks (see Figure 3) and comparing baseline establishment weeks to intervention weeks (see Figure 4) shows an increase in mean and median of daily step count from baseline to

Figure 1

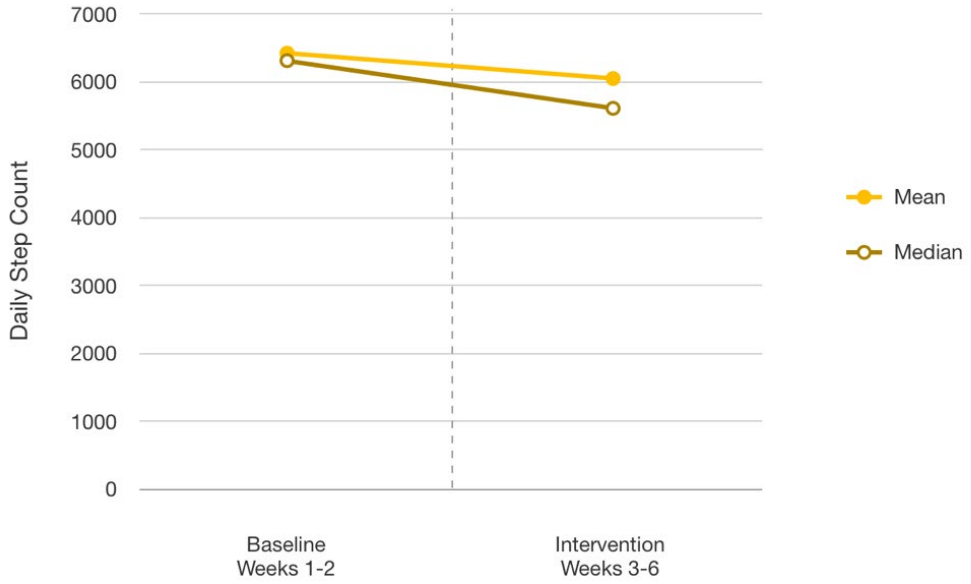
Lone Participant Step Count by Week



Note. Mean and median of daily step count for lone participants by week.

Figure 2

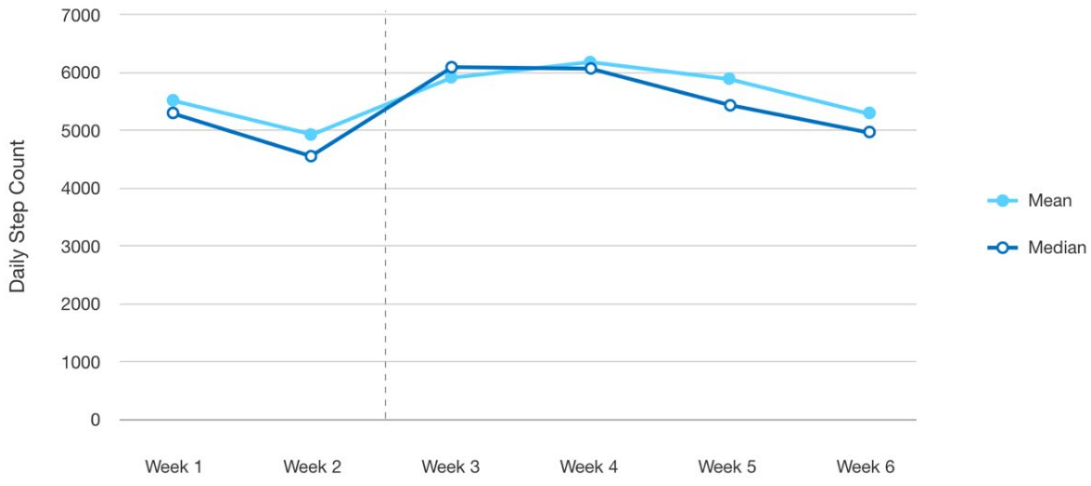
Lone Participant Step Count Baseline and Intervention



Note. Mean and median of daily step count for lone participants decreased from baseline establishment weeks to intervention weeks.

Figure 3

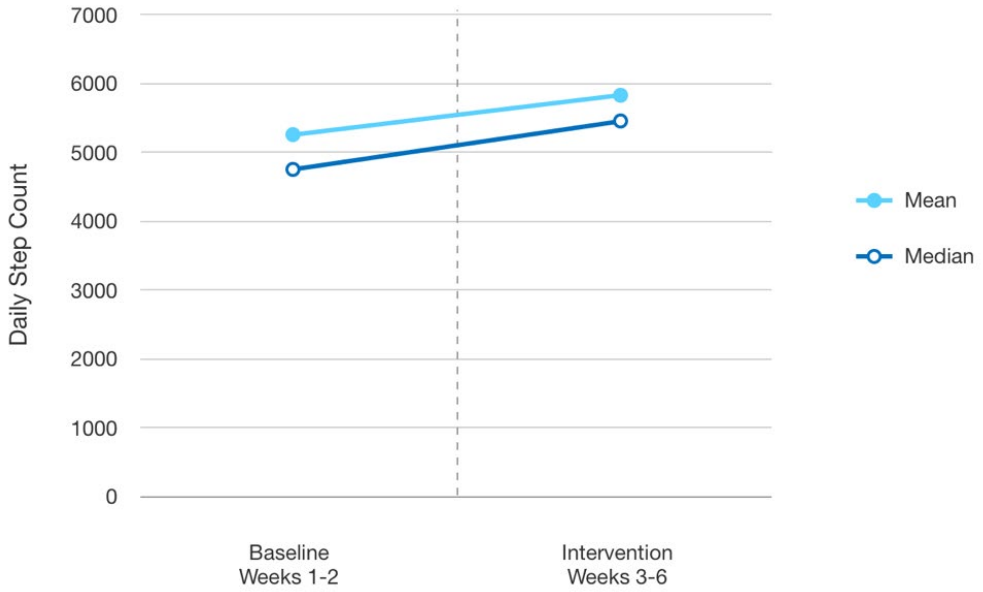
Group Member Step Count by Week



Note. Mean and median of daily step count for cohesive group unit members by week, where the dotted line indicates intervention start.

Figure 2

Group Member Step Count Baseline and Intervention



Note. Mean and median of daily step count for cohesive group unit members increased from baseline establishment weeks to intervention weeks.

intervention. During the baseline establishment weeks, median step count for cohesive group unit members was 4747 (M = 5,232, SD = 2,781), and ranged from 17 to 13,798. During the intervention weeks, median step count for cohesive group unit members increased to 5,450 (M = 5827, SD = 3,071), and ranged from 4 to 16,313.

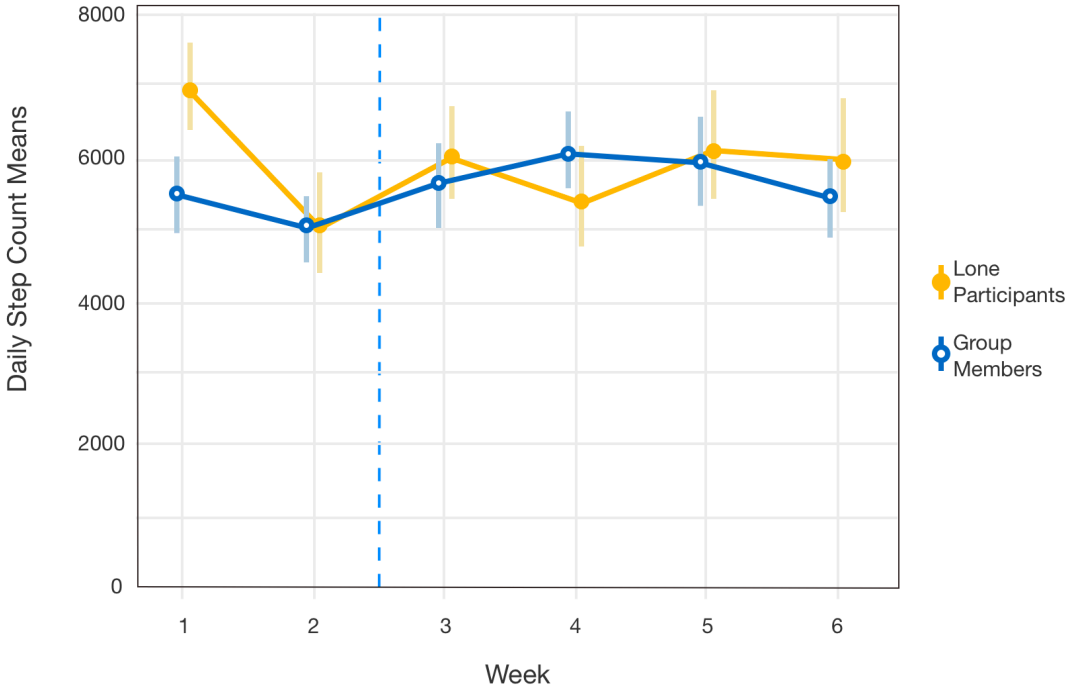
Plots

Person-profile plots were created and segmented by participant type (i.e., lone member or cohesive group unit member) to show variation in daily step count (see Figure H-1 in Appendix H) and weekly step count (see Figure H-2 in Appendix H). The observed weekly means and standard errors of daily step count were plotted and

segmented by participant type (see Figure 5). Box plots were created to show mean, range, and quartiles for daily step count by work-week day (see Figure H-3 in Appendix H). A histogram was created to show steps taken per day by lone participants and cohesive group unit members during baseline establishment weeks and intervention weeks (see Figure H-4 in Appendix H).

Figure 3

Step Count by Participant Pool Over Time



Note. Plots of means and standard errors for step count by week, where the dotted blue line indicates intervention start.

Group Membership by Weeks

A 2x6 mixed design analysis of variance (mixANOVA) modeled mean daily step count to determine if there was any change over time from the baseline weeks to the intervention weeks (within-subjects factor) and if it was moderated by group membership

(between-subjects factor). Evidence was found indicating the interaction of group membership and weeks was significant.

Single value subject daily step count mean imputation of baseline establishment and intervention step count data was used to replace missing data (i.e., zero steps recorded) for baseline and intervention weeks respectively. Prior to analysis, homogeneity of variance (HOV) was assessed using Levene's Test. Mauchly's Test was also used to assess sphericity and the potential need for applying the Greenhouse-Geisser correction. Interactions and main effects were further probed with a priori pairwise and complex comparisons. Tukey's HSD was applied to control Type I error rate inflation due to multiple comparisons.

No evidence of violations to HOV were found, $F(11, 188) = 0.34$, $p = .977$. Evidence was found indicating the assumption of sphericity was potentially violated, $p = .006$, so an epsilon of .699 was used to adjust the degrees of freedom. The within-subjects factor (time, from baseline weeks through intervention weeks) was not found to be significant, nor was the between-subjects factor (group membership), but a significant week-by-intervention interaction was obtained, $F(3.5, 101.3) = 2.69$, $p = .042$, $\eta_p^2 = .08$, indicating the combination of group membership and text reception affected step count.

Pairwise tests between participant groups at each week showed a significant difference at week one, $t(54) = 2.03$, $p = .048$, such that lone members walked an average of 1,839 more steps per day in the first workweek. The remaining 5 weeks' mean daily step counts were not significantly different (see Table H-1 in Appendix H), with the group member participants' weekly means surpassing the lone participants' weekly

means on week 4 and week 5 by 761 and 11 steps per day respectively. The lone participants initially walked more than the group members, but from the second week onward, the control group step count decreased and the treatment group step count increased such that the two participant pools' step counts converged.

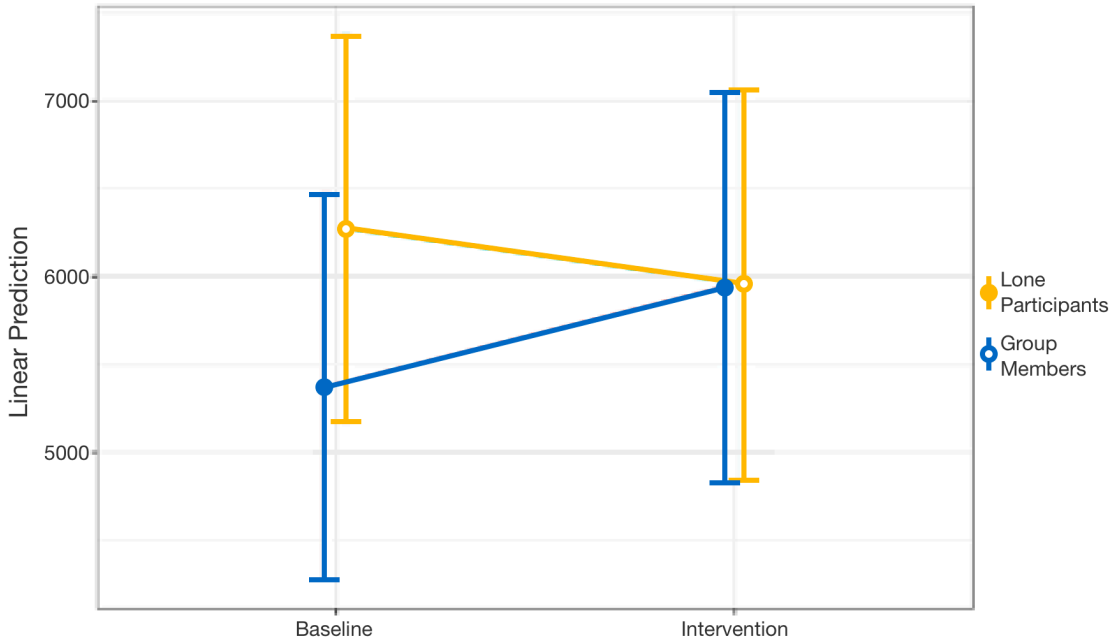
Prompt by Group Membership

To further examine the relationship between daily step count and text prompt moderated by group membership, a 2x2 mixANOVA modeled mean daily step count to determine if there was any change between the within-subjects factor of text prompt intervention (unsent vs. sent) and the between-subjects factor of group membership (lone participant vs. cohesive group unit member). Single value subject daily step count mean imputation of baseline establishment and intervention step count data was used to replace missing data (i.e., daily step count of zero) for baseline and intervention weeks respectively. Prior to analysis, homogeneity of variance (HOV) was assessed using Levene's Test. Interactions and main effects were further probed with a priori pairwise and complex comparisons.

No evidence of violations to HOV were found, $F(3, 64) = 0.38$, $p = .766$. A near significant intervention by group membership interaction was obtained, $F(1, 32) = 3.45$, $p = .073$, $\eta_p^2 = .10$ (see Figure 6). Neither the group membership alone, $F(1, 32) = 0.38$, $p = .541$, $\eta_p^2 = .01$, nor the intervention alone, $F(1, 32) = 0.28$, $p = .602$, $\eta_p^2 = 01$, were significant.

Figure 4

Daily Step Count Estimated Marginal Means Baseline and Intervention



Note. Estimated marginal means of participants' daily step counts segmented by participant pool for baseline establishment and intervention weeks.

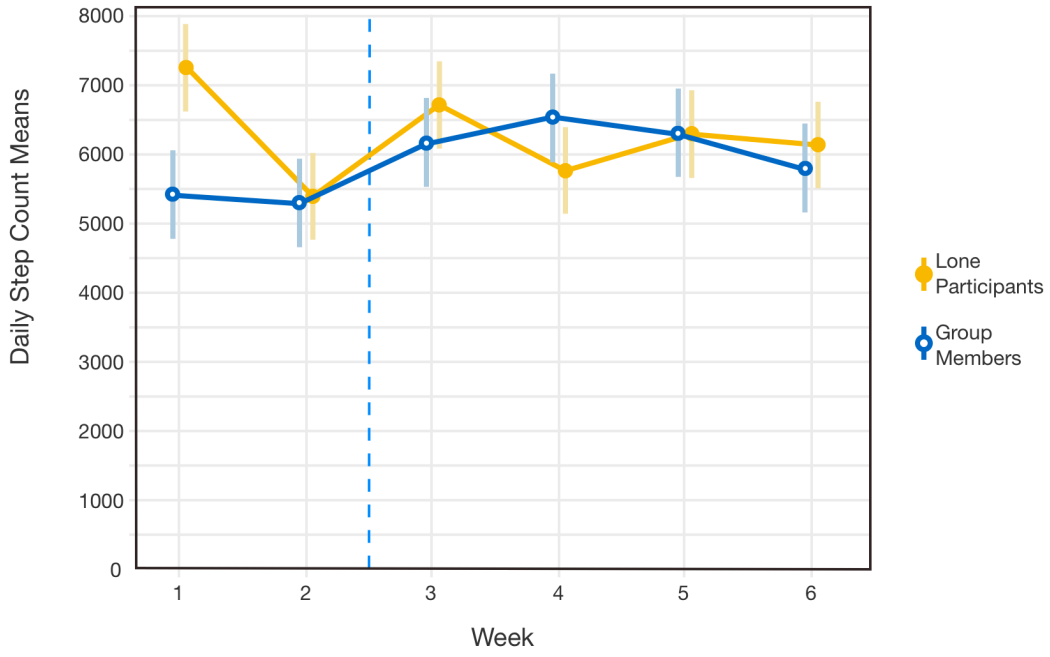
Baseline Comparison

A comparison of the baseline establishment weeks to the intervention weeks showed a significant increase in daily step count for group member participants, but not for lone participants. An a priori planned linear contrast was utilized to compare the two baseline weeks to the subsequent four intervention weeks, assessing the moderating effect of group dynamics on activity prompts. Post hoc comparisons were utilized using Šidák's method for controlling for multiple comparisons and displayed with a plot of the estimated marginal means and their confidence intervals (see Figure 7). A significant difference (3364 steps) was found between the baseline weeks and the intervention weeks for the cohesive group unit members, $t(145) = 2.58$, $p = .022$. No significant difference

was found between the baseline weeks and the intervention weeks for the lone participants, $t(145) = 0.31$, $p = .942$.

Figure 5

Daily Step Count Estimated Marginal Means by Week



Note. Weekly estimated marginal means and confidence intervals for daily step count segmented by participant pool, where the dotted blue line indicates intervention start.

Sensitivity Analysis

Collected data included near-zero daily step count totals, which may indicate devices were not worn for the duration of those days. In postexperimental surveys and interviews, 8 of the 31 participants (26%) indicated that they had concerns about forgetting to wear the Fitbit device or experienced difficulty remembering to wear the device. To reduce the risk of inaccurately reporting significance based on near-zero step count data, a sensitivity analysis was conducted. The 2x6 mixANOVA and the baseline

comparison were re-run with minimum daily step count thresholds of 1, 100, 250, 500 (utilized for all previously reported inferential statistics), 1,000, and 1,500 steps (see Table 1). Significance of the 2x6 mixANOVA persisted at 5 of the 6 thresholds (100 steps or more). Significance of the baseline comparison persisted at 4 of the 6 thresholds (250 steps or more). Persistence of significance for both tests at the majority of thresholds supports rejection of the null hypothesis for the sensitivity analysis.

Table 1

Sensitivity Analysis

Minimum daily step count threshold	2x6 mix ANOVA interaction results	Baseline comparison results
1	$F(3.5, 104.2) = 2.21$, $p = .082$, $\eta^2_p = .07$	$t(150) = 2.11$, $p = .072$
100	$F(3.4, 98.1) = 2.50$, $p = .057$, $\eta^2_p = .08$	$t(145) = 2.81$, $p = .011$
250	$F(3.4, 98.9) = 2.78$, $p = .038$, $\eta^2_p = .09$	$t(145) = 2.96$, $p = .007$
500	$F(3.5, 101.3) = 2.69$, $p = .042$, $\eta^2_p = .08$	$t(145) = 2.58$, $p = .022$
1,000	$F(3.5, 101.3) = 2.69$, $p = .042$, $\eta^2_p = .08$	$t(145) = 2.58$, $p = .022$
1,500	$F(3.5, 101.3) = 2.69$, $p = .042$, $\eta^2_p = .08$	$t(145) = 2.58$, $p = .022$

Significance not found. Significance found

Note. Sensitivity analysis utilizing multiple minimum daily step count thresholds obtained significance at 5 out of 6 thresholds for the 2x6 mixANOVA, and 4 out of 6 thresholds for the baseline comparison.

Qualitative Findings

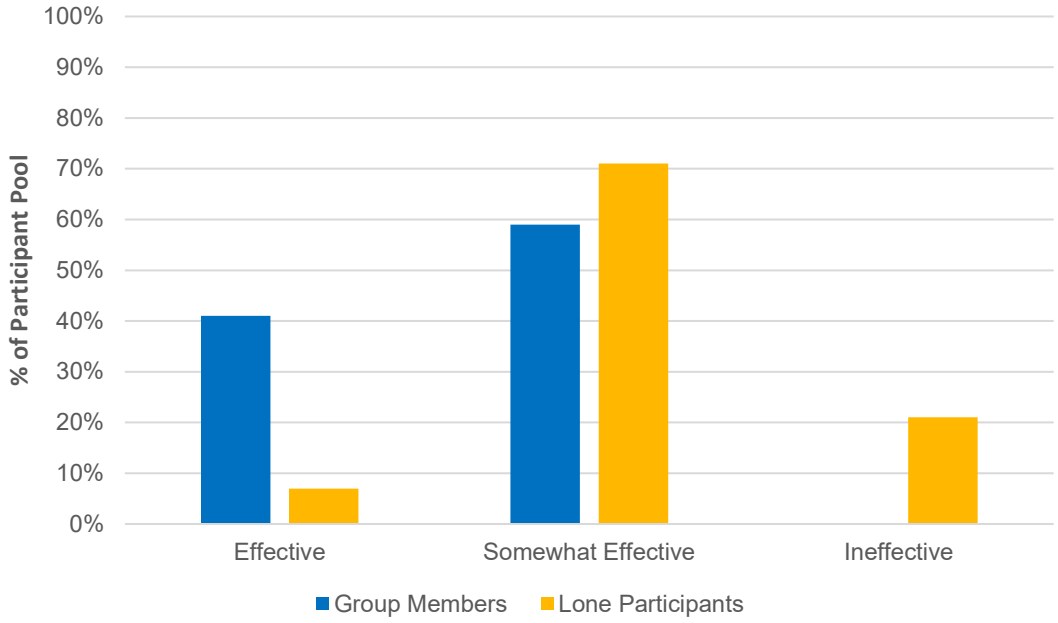
Qualitative analysis was performed on the postexperimental survey and interview responses to identify themes and quantify occurrence in total and by participant type (i.e., lone participant or cohesive group unit member).

Treatment Efficacy

In postexperimental surveys and interviews participants assessed the overall efficacy of the treatment. Group member participants described the treatment as effective more frequently than lone participants (see Figure 8).

Figure 6

Perceived Treatment Efficacy



Note. Self-assessed overall treatment efficacy segmented by participant pool.

Participants were categorized as considering the treatment effective if they described their participation as having a purely positive impact on their walking habits. Participants in this category included Case #02 (group member), who wrote, "I felt like it worked as a reminder," and Case #04 (group member), who wrote, "Having the Fitbit encouraged me to take the stairs each day." Case #15 (group member), also

categorized as considered the treatment effective, wrote, “It was a solid reminder to walk…It certainly kept my mind of walking and made me walk more than I would have.” Case #29 (group member) wrote, “I think the texts encouraged me to get out and move more…I know I took some walks that I wouldn’t have without the reminders…It’s a good, simple idea.”

Participants were categorized as considering the treatment somewhat effective if they described the program as having limited or mixed impact. This included participants like Case #10 (lone participant), who wrote, “I walked a little bit more,” and also those like Case #17 (lone participant), who described the amount of influence as “not much,” or Case #09 (lone participant) who wrote, “I think maybe two or three times towards the beginning of the study I stood up and walked around the office but that’s it.” This group also included Case #06 (lone participant) who wrote, “I found that when I received reminders it helped me get away from my desk more frequently. Although many times I wasn’t able to because I was in the middle of work,” and Case #24 (lone participant), who wrote, “While my office provides a gym, I used the walk reminders as an opportunity to actually take a break and go outside. Some days, there was no effect. Not so much due to lack of interest and more so that I had so much work or was in a meeting.” Anyone who described the treatment’s impact as insubstantial or varied was categorized as considering the treatment somewhat effective.

Participants were categorized as considering the treatment ineffective if they described their walking habits as unchanged, or if no effect was mentioned. This included Case #21 (lone participant), who wrote, “Most of the time the text messages would come

at pretty inconvenient times so I didn't really do what they asked for. The messages did not seem to influence me," and Case #26 (lone participant), who wrote, "…the reminders didn't change my normal behavior."

Of the 31 total participants who submitted feedback through surveys or in interviews, 7 (23%) considered the treatment effective, 21 (68%) considered the treatment somewhat effective, and 3 (10%) considered the treatment ineffective. Of the 14 lone participants who gave feedback, 1 described the treatment as effective (7%), 10 described the treatment as somewhat effective (71%), and 2 described the treatment as ineffective (21%). Of the 17 cohesive group unit members who gave feedback, 7 described the treatment as effective (41%), 11 described the treatment as somewhat effective (65%), and 0 described the treatment as ineffective.

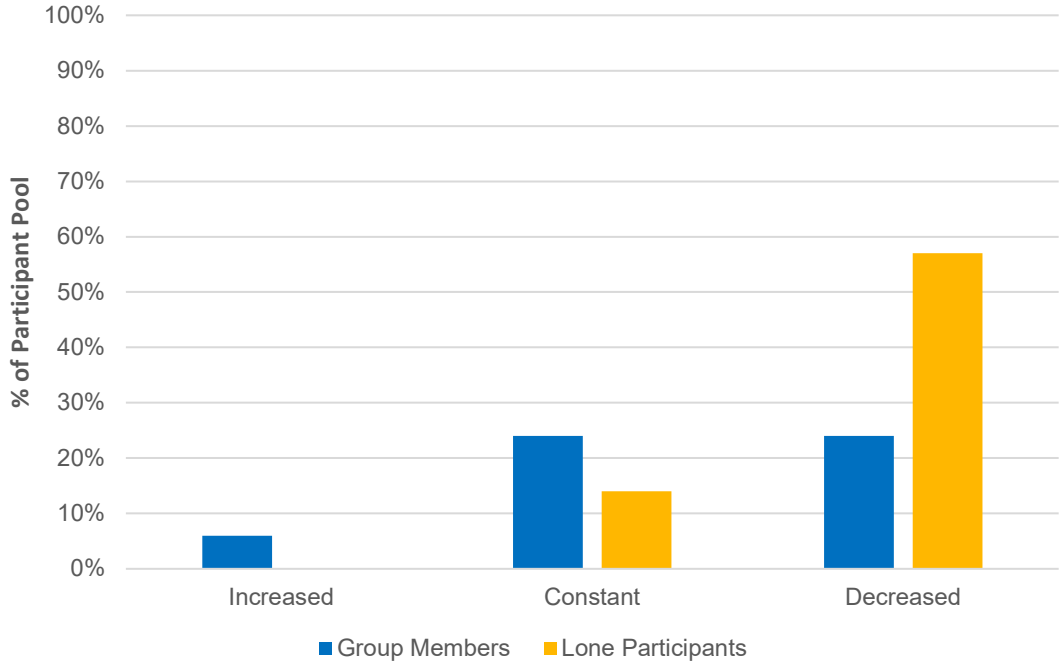
Efficacy Fluctuation

In postexperimental surveys and interviews, participants described overall efficacy of the treatment as decreasing over time, remaining consistent throughout the experiment, or increasing over time (see Figure 9). Group member participants described the treatment efficacy as increasing or remaining constant over time more frequently than lone participants. Lone participants described the treatment efficacy as decreasing over time more frequently than group member participants.

Participants who described efficacy as decreasing over time included Case #09 (lone participant), who wrote, "…after a while I started ignoring it," and Case #14 (lone participant), who wrote, "I wasn't as good at paying attention to the texts over time." Of the 31 total participants who provided feedback, 12 (39%) indicated that the impact of the

Figure 7

Perceived Fluctuation of Treatment Efficacy



Note. Self-assessed fluctuation of treatment efficacy segmented by participant pool.

treatment on their walking habits decreased over time. Of the 14 lone participants who provided feedback, 8 (57%) indicated that the impact of the treatment on their walking habits decreased over time. Of the 17 cohesive group unit members who provided feedback, 4 (24%) indicated that the impact of the treatment on their walking habits decreased over time.

Participants who described the efficacy as constant included those like Case #13 (group member), who said of their response to the texts, “I’d say it was consistent the whole time.” Of the 31 total participants who provided feedback, 6 (19%) indicated that the impact of the treatment on their walking habits was consistent throughout the experiment. Of the 14 lone participants who provided feedback, 2 (14%) indicated that

the impact of the treatment on their walking habits was consistent throughout the experiment. Of the 17 cohesive group unit members who provided feedback, 4 (24%) indicated that the impact of the treatment on their walking habits was consistent throughout the experiment.

Of the 31 total participants who provided feedback, there was only 1 participant (3%), a group member, who indicated that the impact of the treatment on their walking habits increased over time. This represents 6% of the 17 cohesive group unit members who provided feedback. None of the 14 lone participants who provided feedback indicated that the impact of the treatment on their walking habits increased over time.

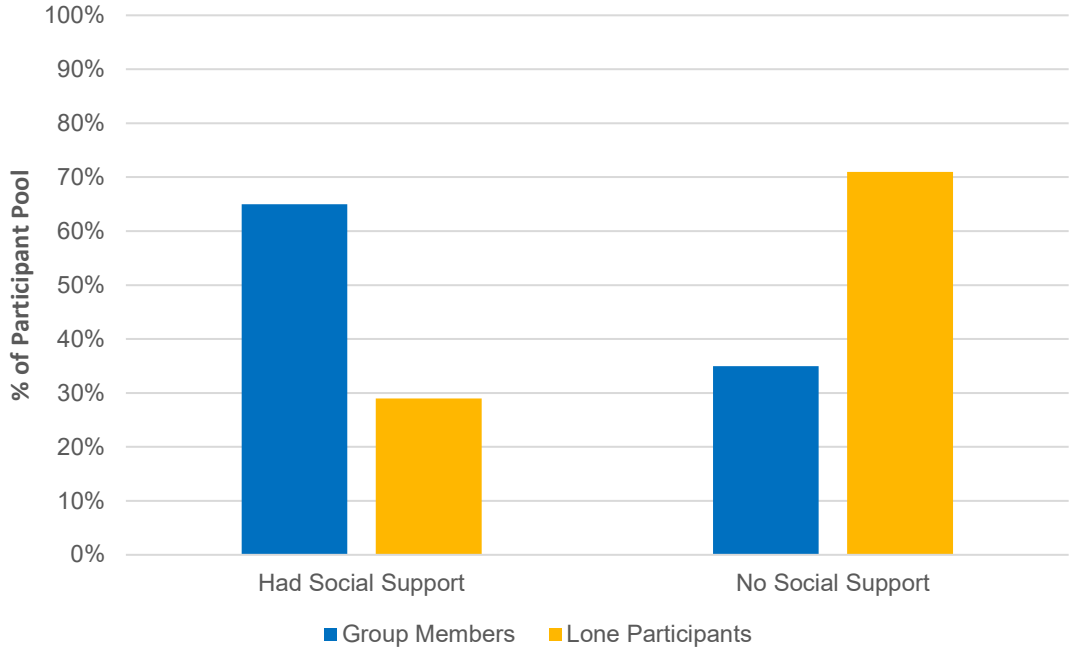
Social Support

In postexperimental surveys and interviews, participants were asked if they were socially supported. Group member participants indicated they were socially supported more frequently than lone participants, and lone participants indicated they did not have social support more frequently than group member participants (see Figure 10).

Participants were categorized as socially supported if they reported receiving encouragement regarding walking from coworkers or others during the experiment, or if they mentioned coworkers or others acting as reminders to walk during the experiment, or if they described coworkers or others increasing their enjoyment of walking during the experiment. This included participants like Case #08 (group member), who when asked if they had social support responded, “Yes, coworkers…we’d usually turn to each other to see who wanted to go on a walk,” and Case #31 (group member), who wrote that the most enjoyable aspect of the experiment was “[t]he interaction with coworkers that were

Figure 8

Perceived Social Support



Note. Self-assessment of presence of social support, segmented by participant pool.

also involved :),” punctuating their response with a smiling emoticon.

Of the 31 total participants who provided feedback, 15 (48%) were categorized as socially supported. Of the 14 lone participants who provided feedback, 4 (29%) were categorized as socially supported. Of the 17 cohesive group unit members who provided feedback, 11 (65%) were categorized as socially supported.

Participants were categorized as socially unsupported if they reported not receiving encouragement regarding walking from coworkers or others during the experiment, did not mention coworkers or others acting as reminders to walk during the experiment, and did not describe coworkers or others increasing their enjoyment of walking during the experiment. This included participants like Case #09 (lone

participant), who responded to being asked if they had social support with, "Unfortunately, no," or Case #21 (lone participant), who responded, "Not specifically about walking more, no." Of the 31 total participants who provided feedback, 15 (48%) were categorized as socially unsupported. Of the 14 lone participants who provided feedback, 10 (71%) were categorized as socially unsupported. Of the 17 cohesive group unit members who provided feedback, 5 (29%) were categorized as socially unsupported.

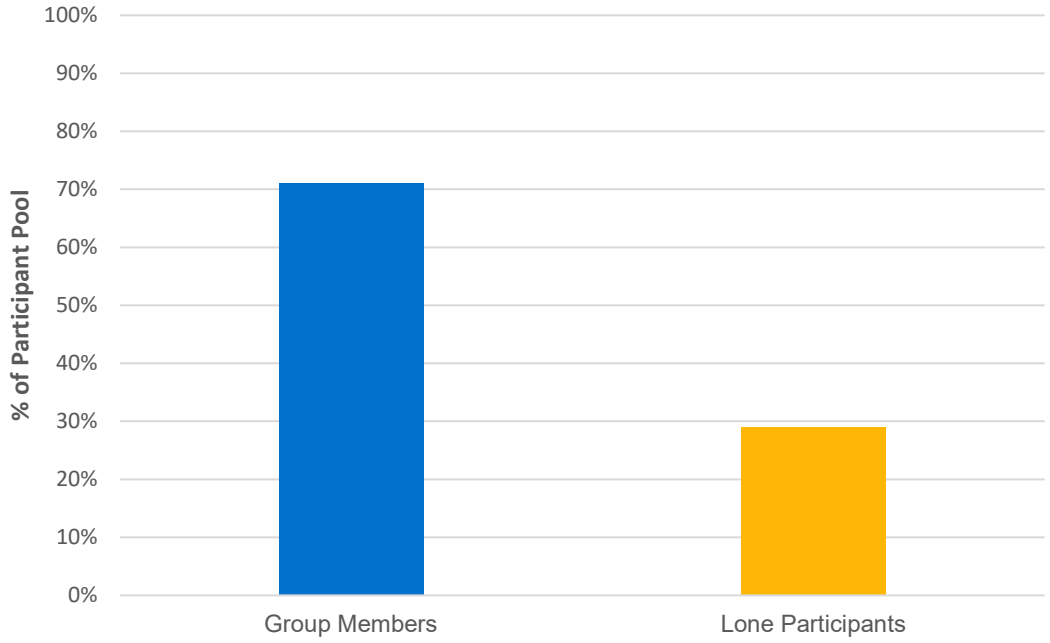
Peer Effect

In postexperimental surveys and interviews, participants described how being socially supported positively affected their attitudes and behaviors during the experiment. They reported this beneficial peer effect as a factor contributing toward: more frequent thoughts about walking, an increased likelihood of walking, an increased enjoyment of walking, and an increase in daily step count. Group member participants were more likely than lone participants to report noticing a peer effect (see Figure 11). This included Case #03 (group member), who wrote that they "rarely remembered to stand up in [sic] [their] own," and Case #05, who wrote, "It was interesting to see that my steps were ao [sic] much less when I woekwd [sic] from home. It made me concious [sic] of how much collaboration in the office drove movement."

Of the 31 total participants who provided feedback, 16 (52%) indicated that social support was a contributing factor in increasing the frequency of their thoughts about walking, their walking likelihood, their enjoyment of walking, or their daily step count. Of the 14 lone participants who provided feedback, 4 (29%) indicated that social support was a contributing factor. Of the 17 cohesive group unit members who provided

Figure 9

Positive Peer Effect Noticed



Note. Self-assessment of positive impact peers had on treatment efficacy, segmented by participant pool.

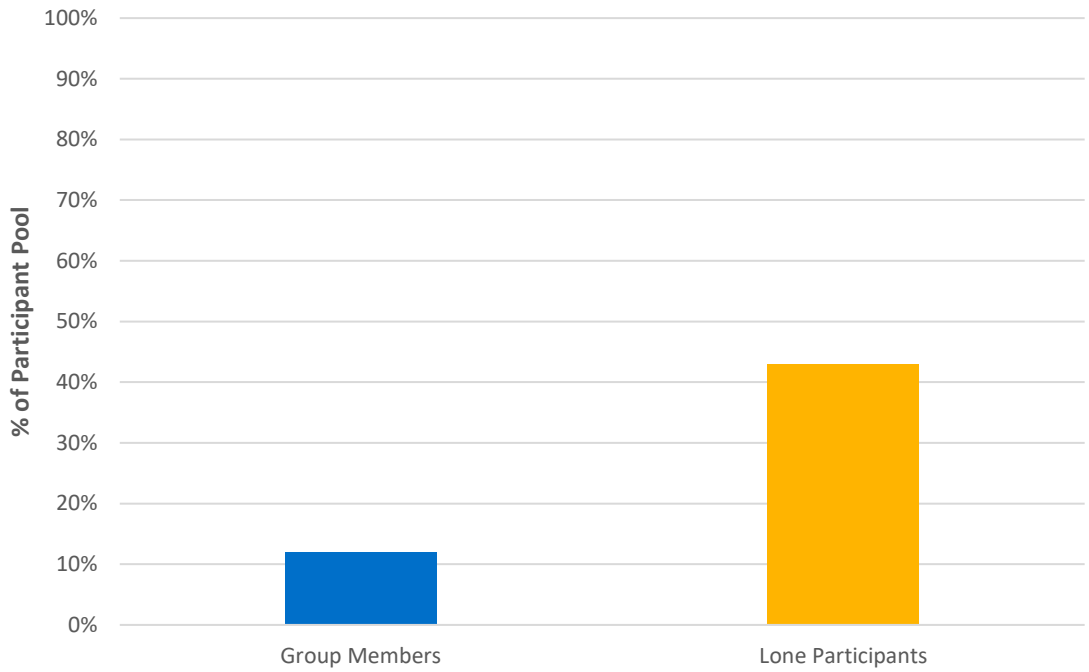
feedback, 12 (71%) indicated that social support was a contributing factor.

In postexperimental surveys and interviews, some participants indicated that, although they did not have social support regarding their walking during the experiment, they thought social support would have had benefits relevant to the experiment, including increasing likelihood to walk, increased enjoyment of walking, or increasing daily step count. Lone participants described how having social support would have been beneficial more frequently than group member participants (see Figure 12).

This included participants like Case #14 (lone participant), who suggested intervention efficacy might be improved by including "group testing to get friends/family involved," as well as Case #22 (lone participant) who said, "…if I would have found a

Figure 10

Theoretical Peer Effect



Note. Self-assessment of how treatment efficacy would have been positively impacted by peer support, segmented by participant pool.

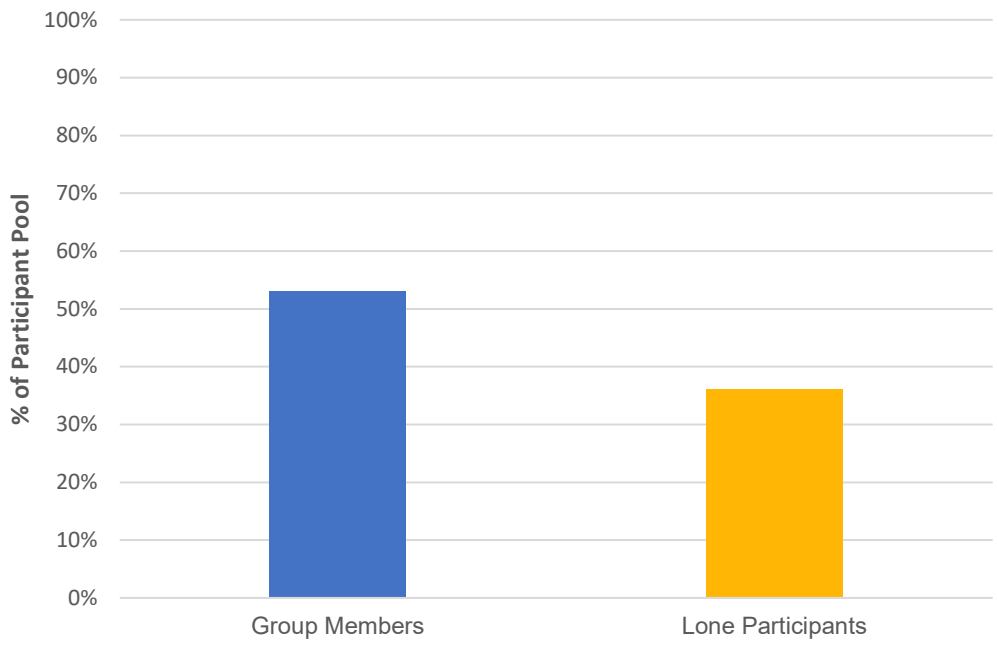
walking buddy, I bet I would take [sic] more steps." Of the 31 total participants who provided feedback, 8 (26%) indicated that having social support would have been theoretically beneficial. Of the 14 lone participants who provided feedback, 6 (43%) indicated that having social support would have been theoretically beneficial. Of the 17 cohesive group unit members who provided feedback, 2 (12%) indicated that having social support would have been theoretically beneficial.

In postexperimental surveys and interviews, some participants indicated that they would benefit from having a larger social component, predicting higher levels of

enjoyment and improvement in treatment efficacy (see Figure 13). This included participants like Case #24 (lone participant), who wrote, "I…would have liked to have a work friend be given the same challenge," and Case #04 (group member), who suggested efficacy could be increased if "the notification came with an accountable buddy system rather than a passive one."

Figure 11

Desire for Increased Social Component



Note. Reported desire for additional social component, segmented by participant pool.

Of the 31 total participants who provided feedback, 14 (45%) indicated that they would benefit from an increased social component during the experiment. Of the 14 lone participants who provided feedback, 5 (36%) indicated that they would benefit from an increased social component during the experiment. Of the 17 cohesive group unit

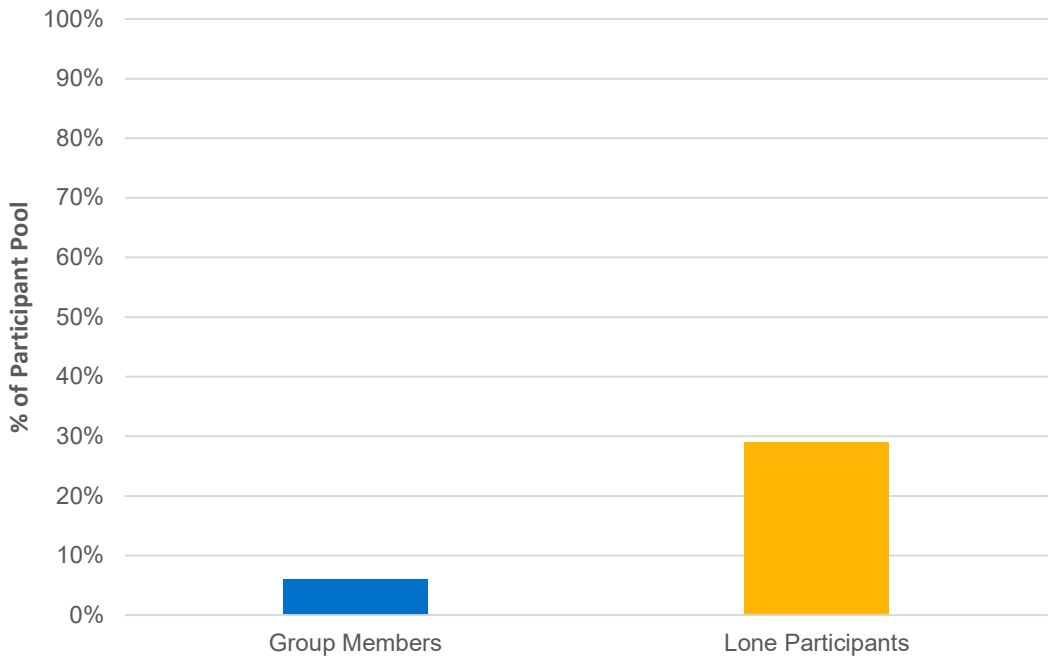
members who provided feedback, 9 (53%) indicated that they would benefit from an increased social component during the experiment.

Immediacy Factor

In postexperimental surveys and interviews, some participants indicated they were unlikely to walk in response to an activity prompt unless they took action directly after receiving it. Lone participants reported the importance of response immediacy on walk likelihood more often than group member participants (see Figure 14). This included participants like Case #19 (lone participant), who wrote, “If the timing wasn’t right I would not end up doing anything and ultimately forgetting…if I was in a window where I

Figure 12

Relevance of Response Immediacy



Note. Self-assessment of immediacy as a factor in likelihood to respond to prompts, segmented by participant pool.

couldn't go at that time, I would usually forget and ultimately it would never happen," and Case #24 (lone participant), who wrote, "Even if it was something I wanted to do later (rather than right when I got the message), some days there was no 'later.'"

Of the 31 total participants who provided feedback, 5 (16%) indicated that immediacy was a factor affecting likelihood to walk in response to an activity prompt. Of the 14 lone participants who provided feedback, 4 (29%) indicated that immediacy was a factor affecting walk likelihood. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that immediacy was a factor.

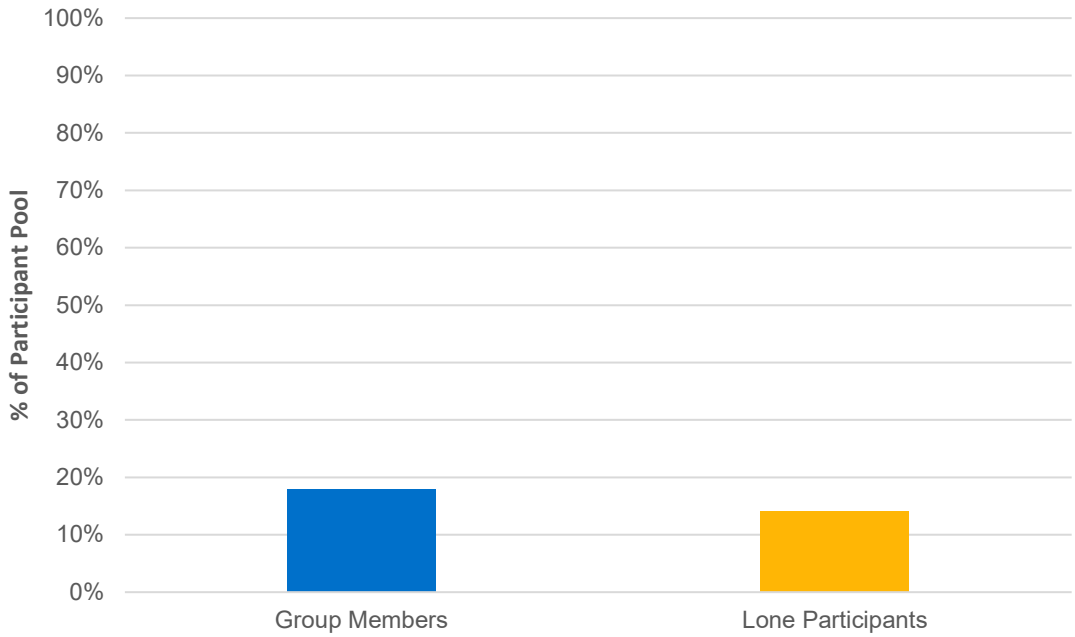
Weather

In postexperimental surveys and interviews, some participants described weather as a factor impacting walk likelihood or walk enjoyment, describing inclement weather as a dampening factor and walks in good weather as enjoyable (see Figure 15). This included participants like Case #15 (group member), who wrote, "It was really hard to be motivated to go out and walk during the time periods especially when it got really cold," and Case #24 (lone participant), who wrote, "I...do not go out of my way to walk outside (inclement winter weather/temperatures)."

Of the 31 total participants who provided feedback, 5 (16%) indicated that weather was a factor in treatment efficacy or enjoyment. Of the 14 lone participants who provided feedback, 2 (14%) indicated that weather was a factor. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that weather was a factor.

Figure 13

Impact of Inclement Weather



Note. Self-assessment of negative impact of inclement weather on treatment efficacy and enjoyment, segmented by participant pool.

Improvements

In postexperimental surveys and interviews. participants suggested modifications to the intervention that they thought would positively impact their likelihood to walk in response to activity prompts (see Figure I-1 and Figure I-2 in Appendix I). Requested improvements included customized message delivery times, dynamically adapting calendar-specific message delivery timing, delivering messages via Slack, a snooze option, an increased social component, a rewards system, device feedback on progress, and goal setting.

Additionally, participants identified issues with the intervention that they thought

negatively impacted their likelihood to walk in response to activity prompts. Criticism included complaints about the message delivery times, messages interrupting work, possessing and wearing multiple activity trackers, concerns about forgetting to wear or charge the device, technical difficulties related to the device, and being unable to comply with activity prompts.

A thorough discussion of recommendations and criticisms surfaced in post-intervention surveys and interviews along with accompanying visualizations of topic frequency can be found in the Improvements and Frustrations sections of Appendix I.

Peripheral Themes

Additional themes peripheral to the research question arose during the postexperimental interviews and surveys. These themes were identified, coded, and quantified. A thorough discussion of these topics and their implications can be found in Appendix I. Identified themes include the impact of being monitored on step count, increased awareness of walking habits, overall enjoyment, sources of social support for participants, timing and frequency of activity prompts, work disruption, delivery format, message tone, physical environment, and the Fitbit device. Additional research is needed to further understand the impact of these factors on treatment efficacy.

CHAPTER VI

DISCUSSION, IMPLICATIONS, (DE)LIMITATIONS, SUGGESTIONS FOR FUTURE RESEARCH, CONCLUSIONS

Discussion

This thesis was designed to explore the relationship between persuasive technology and group membership. The experiment yielded qualitative and quantitative evidence suggesting cohesive group unit membership may positively moderates the relationship between digital activity prompts and the walking habits of Utah tech professionals.

Qualitative Discussion

Postexperimental surveys and interviews were administered to investigate participant perspectives on treatment efficacy, impact of social support on walk likelihood, degree of social support experienced, and other related factors. Themes that may help explain changes in participant step counts were identified and quantified. These findings support the hypothesis that group membership positively moderates the impact of activity prompts on step count.

Efficacy

Findings suggest that group members considered the treatment more effective than lone participants. Forty-one percent of the group member participants described the treatment as effective, compared to 7% of lone participants. Lone participants were more

likely than group members to describe the treatment as ineffective, with 21% of the lone participants describing the treatment as ineffective, and none of group member respondents indicating the same.

Additionally, lone participants described the efficacy of the treatment as diminishing over time more frequently than group member participants—57% of lone participants compared to 24% of group members. Group members were also more likely than lone participants to describe the treatment's efficacy as constant over time (24% compared to 14%) or as increasing over time (6% compared to 0%). Treatment efficacy and change of treatment efficacy over time were both assessed more favorably by group member participants than by lone participants.

Social Support

Findings suggest that participants from both pools considered social support to be a factor contributing to walk likelihood, and that group members experienced more social support than lone participants. 52% of participants indicated that social support was a contributing factor in their walk likelihood during the experiment, and 23% of participants indicated that having social support would have been theoretically beneficial. 45% of participants indicated they would have benefitted from an increased social component.

Additionally, group members were more likely than lone participants to report that they experienced social support during the experiment (65% compared to 29%), and that social support positively impacted their attitudes or behaviors in regard to step count (71% compared to 29%). Overall, the evidence suggests participants viewed social

support as an important factor in regard to walk likelihood, and that group member participants experienced more social support than lone participants.

Weather

Findings suggest that low temperatures and precipitation should be investigated as potentially negative contributing factors in regard to participant step count. Although the topic was not included in the survey questions or interview script, 16% of respondents brought up inclement weather's negative impact on their walk likelihood. The experiment was conducted during the late fall in Utah, but weather data and their relationship to participant step count were not assessed. Additional research is necessary to probe the effects of inclement weather on the relationships between group membership, persuasive technology, and physical activity.

Qualitative Discussion Summary

Emergent themes identified in open-ended postexperimental surveys and interviews suggest that group membership positively moderated the impact of activity prompts on step count during the study. Group member participants and lone participants both described a peer effect—the positive impact of social support on treatment efficacy—and indicated that additional social support would have increased efficacy. Group member participants reported experiencing social support more frequently than lone participants. Group members rated the treatment's efficacy more highly than lone participants, and less frequently described its efficacy as diminishing over time. This evidence collectively suggests that belonging to a cohesive group unit may positively

moderate the impact of activity prompts among members of the studied population.

Quantitative Discussion

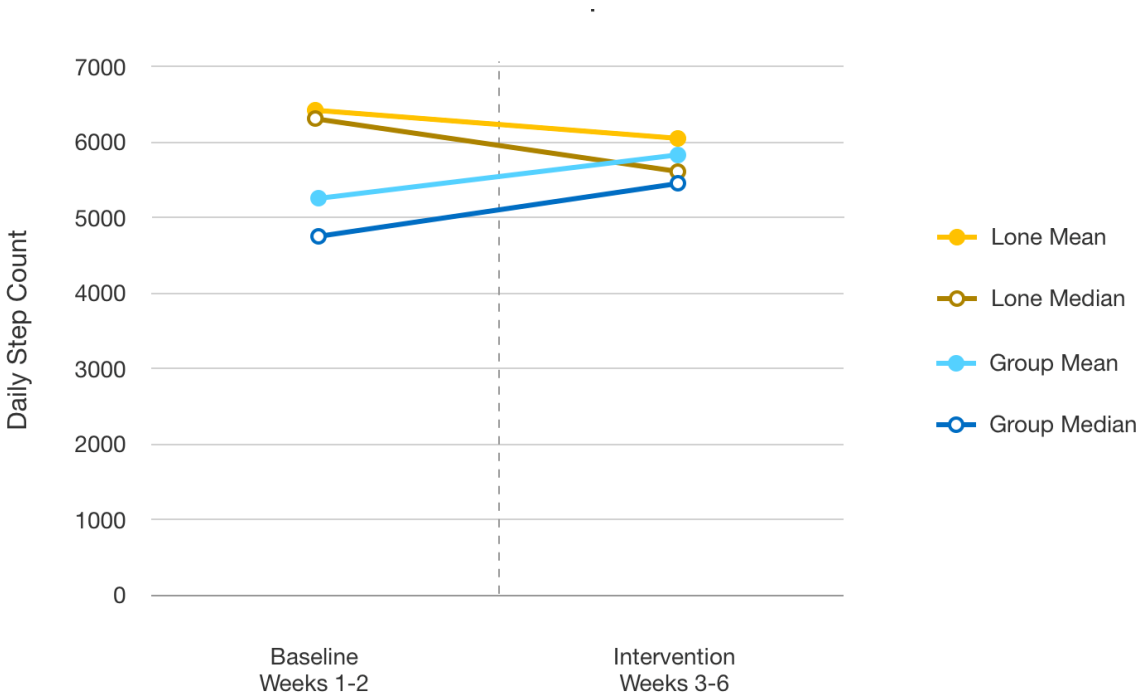
Computation of descriptive statistics and statistical analyses yielded evidence suggesting group membership positively moderates the impact of activity prompts on step count, supporting the qualitative findings above. The efficacy of the activity prompt variable was gauged by comparing step count data across baseline establishment and intervention, and the moderating impact of the group membership variable was gauged by comparing the behavior of the treatment group (cohesive group unit members) and the control group (lone participants). The data show decisively that the lone participants and the group member participants behaved differently in response to activity prompts, suggesting the variable of group membership positively impacted step count.

Baseline Comparison

For group member participants (treatment), the daily step count mean while receiving activity prompts was significantly greater than their pre-intervention step count baseline, indicating intervention success. Lone participants (control) did not experience a step count increase from baseline to intervention, indicating intervention failure (see Figure 16). Were group membership not a positively moderating factor, we would expect the group member step count (treatment) to correspond to the lone participant step count (control) such that the group members would have similarly failed to increase step count from baseline to intervention. Note that progressively colder weather, as identified in the qualitative analysis, may have had a negative impact on walk likelihood among all

Figure 14

Step Count From Baseline to Intervention



Note. Baseline and intervention measurements of central tendency segmented by participant pool.

participants. Additional research is required to explore this and other factors. Regardless, the behavioral difference between the control and treatment groups suggests that the variable of group membership positively moderated the relationship between activity prompts and step count.

Descriptive statistics showed the median daily step count for group member participants increasing from 4,747 (M = 5232) during baseline establishment to 5,450 (M = 5,827) during the intervention. This represents a 14.8% increase in step count from baseline to intervention. Median daily step count for lone participants decreased from 6,314 (M = 6,442) during baseline establishment to 5,598 (M = 6,059) during the intervention—an 11.3% decrease.

A statistical analysis showed the group members' step count increase from baseline to intervention was significant ($p = .022$). The same analysis indicated that lone participants' step counts did not significantly increase after activity prompts began ($p = .942$). This evidence suggests that the variable of group membership positively moderates the relationship between activity prompt and step count.

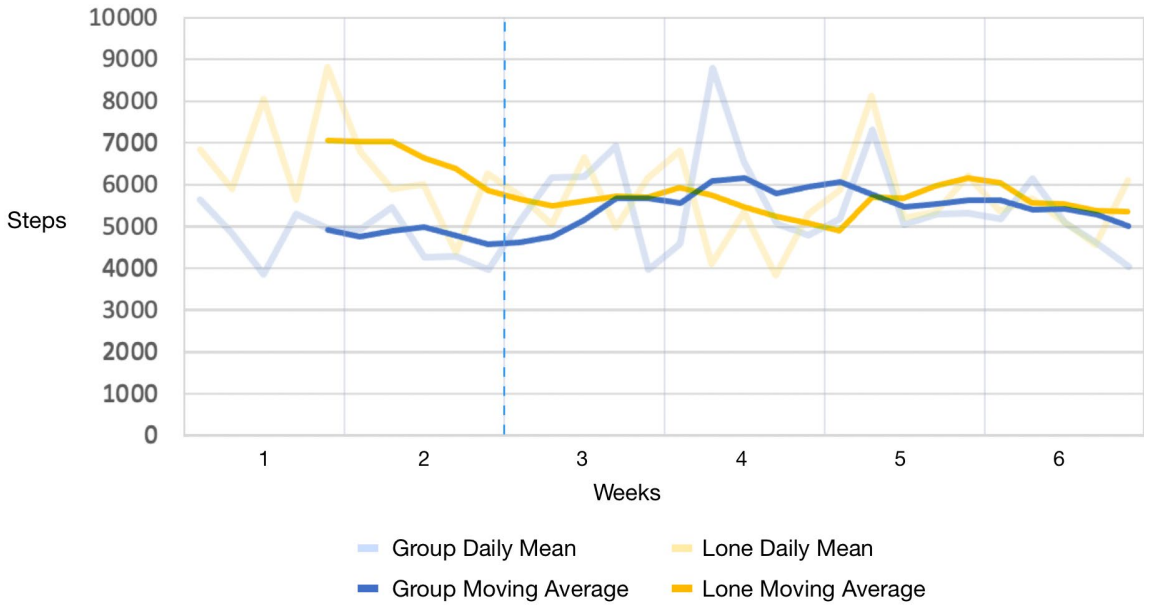
Step Count Convergence

Computation of more granular descriptive statistics showed the mean step count of lone participants (control) on individual days was consistently higher than the group member participants (treatment) during baseline establishment. After activity prompting began, the group member participants' daily step counts began exceeding the lone participants' daily step counts. A 5-day moving average of daily step count median shows lone participants as initially higher than group members, then group members overtaking lone participants after prompting begins, and then converging over time (see Figure 17).

The initial separation and following convergence of the two participant pools' step counts was found to be statistically significant. A 2x6 mixANOVA indicated that there was significant variation associated with the interaction of group membership and activity prompt, such that during the first week the lone participants walked significantly more than the group member participants, and during the second through sixth week there was no significant difference in step count. This increase in step count among group members and decrease in step count among lone participants is additional evidence that the variable of group membership positively impacted step count.

Figure 15

Daily Step Count Moving Average



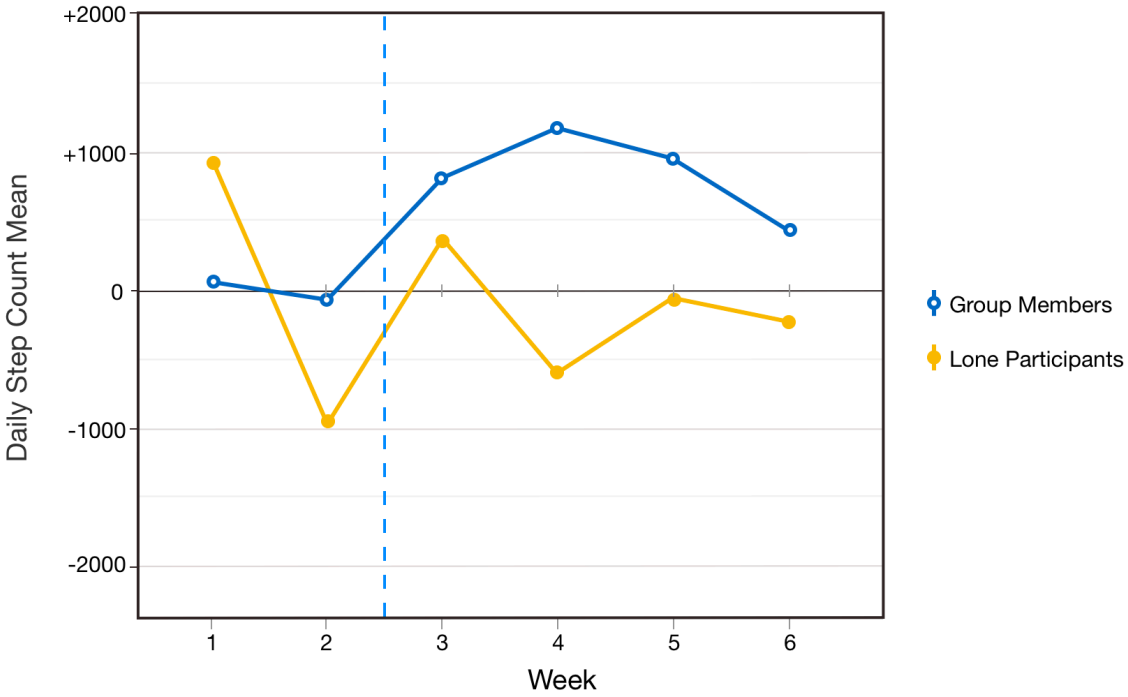
Note. Daily step count median and five-day moving average, segmented by participant pool.

Relative Change

Participants' step counts were monitored for two weeks prior to the initiation of activity prompts to establish behavioral baselines. To accurately determine the efficacy of the treatment on each participant pool, effects must be gauged relative to each pools' baseline. Plotting each participant pool's weekly mean of daily step count relative to their baselines demonstrates the distinctly different response each pool had to the activity prompts (see Figure 18). Comparing the relative post-intervention step count of the group member participants (treatment) to the lone participants (control) provides additional evidence suggesting the variable of group membership positively moderates the relationship between activity prompts and step count.

Figure 16

Change in Step Count Relative to Baseline



Note. Change in weekly mean of daily step count relative to baseline, segmented by participant type.

Quantitative Discussion Summary

Plotting the weekly median of daily step count for the control group shows a downward trend over time. This may be explained by the negative impact of increasingly colder weather mentioned in multiple participant interviews and surveys. Were the null hypothesis true, there should have been a similar decrease in the treatment groups' step count over time. Instead, group member participants walked more when receiving texts compared to their baseline, while lone participants did not. It is clear that the control group and the treatment group responded differently to the intervention when their change in step count relative to baseline is viewed. The initial gap between the group members and treatment members is closed after the intervention begins. This

convergence is can be viewed as a moving average and is confirmed by the 2x6 mixANOVA. Overall, there is quantitative evidence suggesting group membership positively moderates step count.

Implications

If, as the evidence begins to suggest, the hypothesis that membership in cohesive group units amplifies the effects of electronic activity prompts is true, there are a number of implications. Further experimentation is required to confirm the breadth of this experiment's application, but it may be applicable in physical fitness programs, electronic exercise interventions, and corporate exercise programs. Additionally, this research advances the theories upon which it was based, with important implications regarding Fogg Behavioral Model and situated learning theory. Last, this research expands our understanding of the factors that contribute to the efficacy of persuasive technology.

This experiment yielded a significant effect in the interaction of group membership and activity prompt. It is possible that existing physical fitness programs with a social component may increase their efficacy by including electronic activity prompts encouraging participants to be physically active. Similarly, fitness programs with an electronic messaging component may benefit from increasing the degree to which participants are capable of socializing and may see increased success by encouraging participation among cohesive group units, particularly groups similar to those tested here. This includes wearable activity trackers intended to measure and increase physical activity as well as other fitness-centric software interventions.

Perhaps the most obvious application of this research is on corporate health programs. Businesses hoping to improve the physical fitness of their employees may have success instituting activity programs similar to the one designed for this experiment, where cohesive group units are given digital prompts encouraging walking. This is particularly salient for businesses similar to those studied here, targeting employees similar to this experiment's participants. Ultimately, the potential increase in efficacy of physical fitness programs, wearables and other software interventions, and corporate exercise programs related to this research may be a contributing factor in health improvements.

Additionally, this research has broader implications for the theories that provided its foundation. Fogg Behavioral Model and situated learning theory are both advanced by these findings. At the time of this study's literature review, the relationship between group membership and persuasive technologies remained largely unexplored. FBM suggests that motivation, ability, and a trigger are necessary to elicit a target behavior. This research suggests that a fourth factor, group membership, may increase the likelihood of behavioral modification.

Situated learning theory suggests that learning occurs in a real-world context among a community of practice. This research suggests that this learning may benefit from the addition of relevant in-context digital prompts. Additional research should explore the possibility that communities of practice may be created or reinforced through persuasive technology. This research also furthers understanding of persuasive technology and what factors contribute to its efficacy, suggesting the possibility that

group membership may positively impact technological interventions designed to modify behavior outside of physical fitness.

Finally, this research provides understanding that may help inform the design and development of persuasive technology. Activity trackers and other wearables designed to modify behavior may improve their success rates by including context-specific prompting and social components in their interventions. Mobile apps, websites, and other software targeting specific behavioral changes may benefit from the inclusion of prompts and promotion of group participation. This may not be limited to physical fitness. The impact of prompts and group membership on interventions targeting positive behaviors outside of exercise should be explored in further research.

(De)Limitations

There are a number of limitations to this research associated with recruitment methods and participant attributes, experimental design, scale, and unforeseen factors. Understanding these may help improve future research.

Participants and Sampling

The external validity is limited because of the fact that the research was conducted with a convenience sample of a targeted group. The participants were full-time Utah tech professionals, meaning application is limited regionally, socioeconomically, and otherwise in ways related to the behavior, demographics, and mindset specific to Utah tech employees. Additionally, the group was selected because of their association with the primary researcher, meaning it is limited even beyond its noted attributes.

Double Blindness

In addition to sampling limitations, the experimental design was limited due to the fact that, although lone participants were unaware for group members and vice versa, so blindness was maintained, there was no double blindness, in that the primary researcher knew to which group each participant belonged.

Size

The design of the experiment was also limited in scale, both in terms of number of participants and duration. Increasing the number of participants beyond 34 would allow for more statistical power to assess potential results, as well as expansion into a larger number of offices.

Duration

Although based on the conducted literature review, 6 weeks is not atypical in terms of brevity for a study on fitness and technology, the applicability of the results are limited to similar or reduced time periods. Understanding regarding behavior beyond the four-week time period of the intervention is limited. The time period during which the study was conducted may also be a limiting factor, given that during late fall in Utah lowering temperatures may reduce participant likelihood to walk, dampening the perceived benefit of the intervention.

Text Prompt Attributes

The format and timing of the message delivery may also limit external validity. The findings regarding the use of text messages to deliver activity prompts may or may

not be transferrable to other forms of electronic message delivery, such as push notifications or slack messages. Efficacy of the intervention may also be altered by adjusting when the prompts are sent.

Survey Design

While the open-ended survey questions were useful for exploring unknown themes, quantitative analysis would be aided by utilization of multiple-choice responses. Additionally, thorough understanding of survey responses is limited by the inability to probe for additional context and clarification when details or explanations are lacking.

App Usage Compliance

Inability to gauge compliance regarding the instruction to not open the Fitbit application may limit application of findings. Two comments made by participants may imply that they neglected to follow the instructions to avoid opening the app for the duration of the experiment. As such, assumptions regarding the findings being strictly related to the messaging for the group as a whole may be inaccurate.

Near-Zero Step Data

Last, handling of near-zero step count data may limit the validity of the interpretation of the quantitative results. Although data were scrutinized via a sensitivity analysis, without additional participant info it is impossible to know at what point near-zero step count data are indicative of a participant's failure to wear the device for the duration of the day.

Suggestions for Future Research

Future research may be improved by modifications based on the limitations discovered during this research and the participant feedback.

Participant-Suggested Improvements

Participants described improvements they would like to see in the program. Adjustments made to the intervention based on these suggestions and complaints may improve the intervention outcome. It should be noted that external validity is inversely proportional to complexity of the intervention design.

Feedback and Goals

In postexperimental surveys and interviews, 29% of participants recommended including feedback regarding progress or the ability to set goals in order to improve the treatment's efficacy. It is possible that the ability to indicate a goal and view progress made toward it would increase the total number of steps taken per day.

Social Component

Forty-eight percent of participants indicated they thought the treatment would benefit from adding or increasing the social component of the program. This included the idea of adding a competitive element to the intervention. This suggestion aligns with the feedback given regarding the importance of social support in treatment efficacy.

Customization and Dynamic Message Timing

Thirty-two percent of participants indicated that their likelihood of responding to

a text prompt would be improved by providing the ability to customize the timing of the activity prompts or by having message delivery time dynamically adapt to their schedule. This suggestion aligns with the idea that poor delivery timing reduced response rates, that interruptions caused frustrations, and that compliance with activity prompts was either immediate or nonexistent. It may be that intervention efficacy would increase with customized or dynamic delivery times.

Participants

Future research should include a broader selection of participants. Widening the target of the group being studied in terms of location, industry, or age will increase external validity. A larger number of participants should also be included, allowing for cohesive group units to be located in multiple offices. Determining if the program is successful outside of the groups included in this experiment, outside of young people, outside of tech, and outside of Utah is critical to understanding the breadth of application for this type of intervention.

Double Blindness

Although the participants were unaware that other participant types existed (e.g., lone members were unaware of group members and vice versa), there was no component of double blindness to the study, as the primary researcher was aware what group each member was assigned to. Future research should be designed to ensure double blindness.

Duration

Future research should be of a duration significant enough to establish more than

the initial response to an intervention. Future research may benefit from taking place over the course of a year to safeguard from the potential dampening or heightening effects of seasonal changes and weather.

Activity Prompt Format

Testing of additional message formats will increase applicability of the intervention beyond exclusive use of SMS activity prompts. Although the question was not included in the survey or interview script, 10% of participants recommended sending activity prompts through Slack. It may be beneficial to include popular methods of messaging such as Slack or mobile push notifications to future research.

Survey Design

To improve the simplicity of quantitative analysis of survey data, future research should limit the number of open-ended survey questions. Themes identified in this research should be used to inform multiple choice survey questions.

App View Compliance

Participants were asked to avoid opening the Fitbit app in order to restrict motivating factors outside of the activity prompts. To mitigate the data contamination related with compliance violations, in future research participants should be warned that violations may null their participation, and in exit interviews participants should be asked if they violated the request during the experiment. Data may be scrubbed in the event of compliance violations.

Near-Zero Step Data

An unanticipated issue that arose in this experiment was the presence of near-zero step count data from multiple participants. This was addressed using sensitivity analysis and single value imputation. In future research, a specific minimum step count threshold should be set prior to the outset of the experiment. When daily step counts fail to exceed the specified threshold, participants should be contacted to confirm they wore the device for the duration of the day.

Device

Forty-five percent of participants reported experiencing frustrations related to the Fitbit device. Nineteen percent complained about the wristband being poorly designed, 26% expressed concerns about or experienced difficulty remembering to wear the device, 16% worried about or experienced difficulty remembering to charge it, 16% had technical difficulties with the software, and 6% had other hardware complaints. The device used in this experiment were the first-generation Fitbits, and it is possible that at this point some of the design flaws have been resolved. Software issues may be caused by using outdated equipment. Battery life is also negatively impacted by device age, and frequently needing to charge the device increases the likelihood that participants will forget to wear it or that partial day step counts will be reported. Future research should use new, comfortable, modern activity trackers selected with battery life in mind.

Conclusions

Sedentary behavior and physical inactivity are associated with significant health

risks. This research aimed to identify how interventions utilizing persuasive technology might effectively modify these detrimental behaviors. The hypothesis, informed by Fogg Behavioral Model and situated learning theory, was that cohesive group unit membership would positively moderate a prompt-based technological intervention targeting increased physical activity. A quasi-experimental study was designed to test this hypothesis by probing the moderating effects of intraoffice group dynamics on the relationship between SMS activity prompts and the walking habits of Utah tech workers. The baseline daily step count of 17 group member participants and 17 lone participants was measured for two weeks, after which both participant pools were sent SMS activity prompts twice each workweek day encouraging them to walk.

Postexperimental surveys and interviews were conducted to determine self-assessment of intervention efficacy and to explore factors contributing to the treatment's success. Step count data were analyzed to determine the extent to which each participant pool was affected by the activity prompt intervention. Rejection of the null hypothesis was predicated on the identification of quantitative and qualitative evidence suggesting that the intervention was more effective among group members than lone participants. Evidence of this nature was found.

The qualitative analysis yielded findings in alignment with hypothetical expectations, including self-assessment of intervention efficacy and identification of contributing factors. The data suggest that group members were more positively impacted by the intervention than lone participants. Group members more frequently indicated that the intervention was effective, and lone participants more frequently indicated the

intervention was ineffective (see Figure 8). Group members more frequently described treatment efficacy over time as constant or increasing; lone participants, as decreasing (see Figure 9). These data indicate that the treatment was perceived as more effective among group members than lone participants.

Exploration of factors contributing to treatment efficacy uncovered further evidence in support of rejecting the null hypothesis. Participants from both pools indicated that social support positively impacted treatment success (see Figure 11 and Figure 12). Group members indicated that they experienced more social support than lone participants (see Figure 10). This suggests that the variable of group membership may help explain discrepancies in relative change of step count mean between the control group (lone participants) and the treatment group (group member participants).

Step count data were analyzed to demonstrate impact of treatment and impact of group membership by comparing relative change in step count from baseline to intervention between participant pools. Quantitative evidence was found confirming the participant-assessed efficacy, further supporting rejection of the null hypothesis.

An accurate assessment of treatment efficacy requires comparison of each pools' behavior relative to their baseline. Comparing baseline weeks to intervention weeks showed an increase in daily step count for the group member participants, and a decrease for the lone participants (see Figure 16). An a priori planned linear contrast lent statistical support to these observations, confirming that the group member participants exhibited a significant increase in step count from baseline to intervention ($p = .022$), and the lone participants did not ($p = .022$). The two participant pools' starkly difference reactions to

the intervention are clear when weekly mean of daily step count relative to baseline is plotted over time (see Figure 18).

The control pool (lone participants) step count trends downward over time, possibly due to increasingly inclement weather conditions associated with the seasonal shift from fall to winter. Lone participants appear to experience a noticeable but fleeting reaction to the initiation of the activity prompts. In contrast, the treatment pool (group member participants) trends downward from week one to week two, and experiences a similar post-intervention increase in step count, but this reaction is more sustained. Were group membership not a positively moderating factor, we would expect the treatment group to exhibit the same downward trend the control group experienced. This evidence supports the hypothesis that group membership is a positively moderating factor.

Plotting the 5-day moving average of daily step count mean shows the control group as walking more than the treatment group during baseline establishment, after which the treatment groups' step count exceeds the control group, and then ultimately the two groups' step counts converge. The 2x6 mixANOVA showed this variance to be significant, such that during the first week the lone participants walked more than the group member participants, but not for the remaining weeks. Despite their lower baseline step count, the group members' weekly means of daily step count exceeded those of the lone participants twice during the intervention.

Additional investigation is warranted at a larger scale with a double-blind experimental design. This research should be conducted over the course of a long enough time to mitigate the dampening effects of inclement weather associated with the onset of

winter. Improvements to the treatment based on participant feedback should be implemented, including but not limited to: alternative message delivery formats, dynamic or customizable delivery times, inclusion of a snooze option, and utilizing an improved activity monitor.

In summation, the qualitative evidence indicates that participants from both pools viewed social support as a factor impacting treatment efficacy, that cohesive group unit members experienced more social support than their lone participant counterparts, and that group members more often than lone participants perceived the treatment to be effective. These self-assessments are in line with the quantitative findings. Plotting change in mean of daily step count relative to baseline demonstrates what the statistical analyses confirm: the group members' step count increased from baseline to intervention, the lone participants' did not. Overall, the qualitative and quantitative evidence suggest that group membership positively moderates the relationship between SMS activity prompts and step count among Utah tech professionals.

These findings inform an increased understanding of how group membership and context-specific activity prompts impact the efficacy of persuasive technology. As a result, the theories that provided the foundation for this research have been expanded. The benefits of pairing the context-specific prompts of Fogg's Behavioral Model with the social groups and real-world context of situated learning theory may help inform the design of future interventions. Practical applications include persuasive technology, physical fitness programs, corporate wellness programs, and other interventions designed to modify behavior. Future studies should validate and expand upon these findings in

order to facilitate the development and improvement of technological interventions targeting increased physical and mental health.

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APPENDICES

Appendix A

SMS Activity Prompt Messages

SMS Activity Prompt Messages

WEEK 1

1.1.1 Hi! This is your friendly walk reminder! :) Want to go on a walk?

1.1.2 How about a nice walk?

1.2.1 Walking is fun! Want to go on a walk?

1.2.2 Walk time!

1.3.1 Time for a nice walk. You can do it!

1.3.2 It's that time. The time where I remind you to go on a walk. :)

1.4.1 How about going on a nice walk?

1.4.2 You should definitely try walking right now. It will be great!

1.5.1 It's walk time!

1.5.2 You know what sounds great right about now? Walking!

WEEK 2

2.1.1 Walk time! You can do it!

2.1.2 Wouldn't it feel nice to take a walk right about now?

2.2.1 How about a nice walk?

2.2.2 Afternoon walk!

2.3.1 Walking is fun! You should go on a walk. :)

2.3.2 Want to go on a walk?

2.4.1 Wouldn't it feel nice to take a walk right about now?

2.4.2 Walk time!

2.5.1 Time for a nice walk. You can do it!

2.5.2 How about going on a nice walk?a;

WEEK 3

3.1.1 Hi! This is your friendly walk reminder! :) Want to go on a walk?

3.1.2 How about a nice walk?

3.2.1 Walking is fun! Want to go on a walk?

3.2.2 Walk time!

3.3.1 Time for a nice walk. You can do it!

3.3.2 It's that time. The time where I remind you to go on a walk. :)

3.4.1 How about going on a nice walk?

3.4.2 You should definitely try walking right now. It will be great!

3.5.1 It's walk time!

3.5.2 You know what sounds great right about now? Walking!

WEEK 4

4.1.1 Walk time! You can do it!

4.1.2 Wouldn't it feel nice to take a walk right about now?

4.2.1 How about a nice walk?

4.2.2 Afternoon walk!

4.3.1 Walking is fun! You should go on a walk. :)

4.3.2 Want to go on a walk?

4.4.1 Wouldn't it feel nice to take a walk right about now?

4.4.2 Walk time!

4.5.1 Time for a nice walk. You can do it!

4.5.2 How about going on a nice walk?

Appendix B

Informed Consent Form

Informed Consent Form

Introduction
You are invited to participate in a research study conducted by Kristy Bloxham, a Professional Practice Associate Professor in Instructional Technology and Learning Sciences Department at Utah State University. The purpose of this research is to determine the effects of SMS message activity prompts upon the activity habits of Utah tech workers. Your participation is entirely voluntary.

This form includes detailed information on the research to help you decide whether to participate. Please read it carefully and ask any questions you have before you agree to participate.

Procedures
Your participation will involve wearing a Fitbit for six weeks, and receiving reminder SMS messages at 11:30 a.m. and 2:30 p.m. Monday through Friday for the last four weeks of the study. If you agree to participate, the researchers will collect anonymized information about your number of steps each day during the experiment. We anticipate that 30 people will participate in the study across all sites.

Before you read this form, you responded to some questions regarding your interest in becoming more physically active, your age, your smartphone ownership, and your current work status. Researchers will destroy that data once you agree to enter the full study.

Risks
This is a minimal risk research study. That means that the risks of participating are no more likely or serious than those you encounter in everyday activities.

Benefits
Although you will not directly benefit from this study, it has been designed to learn more about how technology can be used to influence exercise behavior.

Confidentiality
The researchers will make every effort to ensure that the information you provide as part of this study remains confidential. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study.

We will collect your information through interviews or surveys and through the Fitbit you wear. Online activities always carry a risk of a data breach, but we will use systems and processes that minimize breach opportunities. Additionally, your data will be anonymized, so in the event of a breach, it will not be directly associated with you. Anonymized information about the number of steps you have taken will be stored on your Fitbit account. Any additional data, including your phone number, will not be associated with your name, and will be securely stored in a restricted-access folder on

Box.com, an encrypted, cloud-based storage system. This data will be kept for three years after the study is complete, and then it will be destroyed. This form will be kept for three years after the study is complete, and then it will be destroyed.

It is unlikely, but possible, that others (Utah State University, or state or federal officials) may require us to share the information you give us from the study to ensure that the research was conducted safely and appropriately. We will only share your information if law or policy requires us to do so.

Voluntary Participation & Withdrawal
Your participation in this research is completely voluntary. If you agree to participate now and change your mind later, you may withdraw at any time by returning your Fitbit to the researcher. If you choose to withdraw after we have already collected information about you, we will remove your data from the study.

Compensation
Compensation is not offered for participation in this research study.

Findings
If the researchers learn anything new during the course of this research study that might affect your willingness to continue participation, you will be contacted about those findings. This might include changes in procedures, changes in the risks or benefits of participation, or any new alternatives to participation that the researchers learn about.

Identifiers may be removed from your information. These de-identified data may be used or distributed for future research without additional consent from you. If you do not wish for us to use your information in this way, please state so below.

Once the research study is complete, the researchers will email you the findings of the study, including aggregate results relating to your participation.

IRB Review
The Institutional Review Board (IRB) for the protection of human research participants at Utah State University has reviewed and approved this study. If you have questions about the research study itself, please contact the Principal Investigator at 435-881-5138 or kristy.bloxham@usu.edu. If you have questions about your rights or would simply like to speak with someone other than the research team about questions or concerns, please contact the IRB Director at (435) 797-0567 or irb@usu.edu.

Kristy Bloxham
Principal Investigator
435-881-5138; kristy.bloxham@usu.edu

David Moore
Student Investigator
801-836-4689; email@usu.edu

Informed Consent

By signing below, you agree to participate in this study. You indicate that you understand the risks and benefits of participation, and that you know what you will be asked to do. You also agree that you have asked any questions you might have, and are clear on how to stop your participation in the study if you choose to do so. Please be sure to retain a copy of this form for your records.

_____	_____	_____
Participant's Signature	Date	Participant's Name, Printed

[ ] I do not agree to allow my de-identified information to be used or shared for future research.

Appendix C

Initial Intake Form

INTAKE FORM

Please fill out the following:

Age _____

Sex _____

Ethnicity _____

To be completed by researcher:

Random Number _____

Appendix D

Exit Interview and Survey Questions

EXIT INTERVIEW AND SURVEY QUESTIONS

In the interviews, these questions will be asked of the participant in a conversational format, where phrasing and order may be adjusted, with follow-up questions asked when necessary in order to encourage thorough responses.

1. What was your experience like?

2. Can you tell me about your typical experience getting a text message? Did that change over time?

3. Tell me about how the text messages influenced how much you walked each day.

4. Did you have any social support—family, peers, or others—that helped encourage you?

5. What did you enjoy the most about your experience?

6. What frustrated you the most about your experience?

7. What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

8. Is there anything else you want to tell me about your experience?

Appendix E

Participation Screener

PARTICIPATION SCREENER

Please circle your response for each of the following questions:

Are you between 25 and 45 years old?

Yes No

Do you want to be more physically active?

Yes No

Do you currently own an iOS or Android mobile device?

Yes No

Are you currently employed full-time at a tech company?

Yes No

Do you work at an office in Utah?

Yes No

Appendix F

Interview Transcripts

CASE #02 (GROUP MEMBER) INTERVIEW TRANSCRIPT

Researcher 0:09
So yeah, like I said, we're just gonna ask you a couple questions about your experience to kind of hopefully learn a little bit more about what the experience was like for you, what worked and what didn't, what you enjoyed, what you didn't enjoy, and maybe what could make the treatment more effective. So if you remember we had, the experiment took place over six weeks, right? First two weeks, you just wore a Fitbit. And then for the last four weeks, you were getting two text messages each day at like 11:30 and 2pm. Right?

Participant 002 0:37
Right.

Researcher 0:39
So can you sort of walk me through from the beginning of the project to the end of the project, what was your experience like? Just tell me a little bit about your experience.

Participant 002 0:49
This is when I was getting text messages or the whole project?

Researcher 0:52
The whole project.

Participant 002 0:53
The whole project, okay. So for me, the biggest thing that stands out is having the wristwatch. Um, I wasn't used to it. But I did it only because, to help you out, [researcher name redacted]. [Laughs] Then, but then that's fine though because later on I started to see the benefit, that it was keeping track of my steps. And even though I wasn't allowed to see my steps, I knew it was counting it. So there was times where I was like, well, I could get water from upstairs or I could get water from downstairs, but because I felt like somebody was tracking me, I was going a little bit further. So it, maybe it motivated me even though I wasn't really tracking my own steps, I wasn't trying to break my own record, but I just felt like somebody was watching me, and I was trying to put more steps in. And I think throughout that period during the study, I don't think I'm missed—I might have missed like three days from my regular morning run that I do, and I haven't done that for a while now. So maybe I should participate in more of your studies. [Laughs]

Researcher 1:33
[Laughs] That's interesting. So the idea of just being observed or being tracked, that influenced your behavior?

Participant 002 2:14
Yes. A lot.

Researcher 2:17
And then you said that, like, did you say you didn't like wearing the wristband? Like—

Participant 002 2:22
Yeah, it's not for me. It's not my thing.

Researcher 2:24
Okay, why?

Participant 002 2:27
It's just uncomfortable. I used have, I used to—maybe I'm not used to it because I used to carry watches when I was a young kid, but, um, I kind of fell off that, and now I just don't like to have anything on my wrist. But I don't see that—I could see myself getting used to it again if I had to.

Researcher 2:46
Gotcha, gotcha. Okay.

Participant 002 2:47
But that was the biggest thing that was bothering me and—oh, here's another thing, the charging. That kind of freaked me out the one time when I wasn't charged for like, two and a half days or something like that, and—

Researcher 3:02
Yeah, because you have to charge it pretty frequently right?

Participant 002 3:05
I think it's every other day. And the funny thing is my wife saw me wearing it. And for Christmas I got her one. I got her a Versa 2. Yeah, and she is so pumped on it, she uses it every day, and she's always telling me about it. So, I thought it was funny too, because she saw me wearing it and she's like, "How come you get to have one?" [Laughs]

Researcher 3:30
[Laughs] That's really funny.

Participant 002 3:31
So it works for her. And she's used to having watches, so I don't think it's a big adjustment for her.

Researcher 3:36
Gotcha. Can you talk me through what the typical experience of getting a text message was like? So like, what were you typically doing, and then what would happen when you received the message?

Participant 002 3:52
Emotion-wise I was excited, because it kind of pulled me away from whatever I was doing, and sometimes you tend to get, um, you know, you just get swamped with working. You don't tend to look up and try to do, uh, step away for a bit. And getting those text messages was great, because it gave me an excuse of saying, "Okay, well, I gotta do my walk." And that kind of, kind of unplugged me a little bit from work just to unwind a little bit and and come back again.

Researcher 4:26
So were you typically just at your desk or were you in meetings?

Participant 002 4:29
Yes, I was typically at my desk. If I was in a meeting, I wasn't able to walk.

Researcher 4:34
Sure.

Participant 002 4:34
Typically, I'll be at my desk, and then I'll get text messages. And that would just kind of let me be able to unplug for a little bit and just walk. And that was just, and that was just, it felt good coming back to that. After that, I was just like...

Researcher 4:52
Did any of that change over time? Was there a difference at the beginning versus the end?

Participant 002 4:57
No, I think I was pretty consistent in doing it. I was—I know there's a couple of days I missed, but I missed only because I was in meetings. But, um, I don't think it changed. I will say after the study I didn't continue that habit.

Researcher 5:18
Gotcha. So you think the text messages affected your behavior?

Participant 002 5:23
Absolutely.

Researcher 5:26
And how much did it make you walk each day, do you think?

Participant 002 5:31
I think at least from five to 15 minutes, or maybe more.

Researcher 5:39
Okay. Did you have like a set routine you went through? Or was it sort of random or what?

Participant 002 5:44
Random, it was just random.

Researcher 5:46
So sometimes short, sometimes long, whatever.

Participant 002 5:48
Yeah. Mmhm. Yeah. I think all of that would depend on who I was with.

Researcher 5:54
Oh, okay.

Participant 002 5:55
If I was walking with somebody else, or if I was just doing it by myself. If I was doing it by myself, I would just going downstairs, it would be the shortest walk. But if I was, uh, walking with somebody else in our floor up here, then it'll be, tend to be a little longer walk.

Researcher 6:12
Um, so on that note, what kind of social support did you have? Family or coworkers or peers or other people?

Participant 002 6:19
Yeah, [coworker name redacted]. [coworker name redacted] would just look over, you know be like, "Are you ready for your walk?" and I'd be like, "Yep, let's do this." That, he was my support over here.

Researcher 6:31
Nice. And that helped encourage you?

Participant 002 6:34
Oh, yeah, for sure.

Researcher 6:37
Was it like, him pressuring you, or you pressuring him or both?

Participant 002 6:44
No, it was more like him reminding me that we had to do our walk. So it wasn't, it wasn't a pressure from either one. It was just the fact that he reminded me that we had to do the walk.

Researcher 6:55
Did you remind him too?

Participant 002 6:57
I think it was more him, reminding me.

Researcher 6:59
Oh, okay, gotcha.

Participant 002 7:01
Yeah.

Researcher 7:02
What did you enjoy most about the experience?

Participant 002 7:06
Um, just knowing that, um, I guess. What would I enjoy the most? It was the fact that I was able to unplug a little bit from work. Because a lot of times, I was just under pressure and being able to unplug and forget for a bit, even if it was 15 minutes, 10 minutes, that felt good.

Researcher 7:27
Nice.

Participant 002 7:28
And I think that was the most rewarding thing from that. Plus, obviously, in the back of my mind, I kept trying to think like, "I need to put more steps in."

Researcher 7:37
Was the timing of the messages good for you?

Participant 002 7:40
Yeah, that worked.

Researcher 7:42
Really? Okay.

Participant 002 7:43
Yeah.

Researcher 7:43
So you didn't frequently find yourself in meetings or...?

Participant 002 7:47
There was times, there was probably a couple days in a row that I did find myself in meetings and I wasn't able to do the walks but other than that, I think the timing was perfect.

Researcher 7:57
Did you end up walking after the meeting, or If you were in a meeting, it was just like, Okay, today's—

Participant 002 8:01
No, I would just say forget it. Yeah.

Researcher 8:06
So was—

Participant 002 8:06
If it was more than, if it was more than five minutes, or maybe 10 minutes, then I would just say forget it. I'll do it in the next walk.

Researcher 8:14
Gotcha. Gotcha. And what about was twice a day a good pace for you? Would you would like to have more or less?

Participant 002 8:24
That was good. I would try maybe doing, I would try three just to see how that works. But if that seems a little excessive, then then I would go back to two.

Researcher 8:35
Okay.

Participant 002 8:35
Because that seem like it fit. It wasn't too frequent, it was, it was perfect.

Researcher 8:42
Would you like to have been able to adjust that yourself?

Participant 002 8:47
No, because I would keep it at two.

Researcher 8:49
Oh, okay.

Participant 002 8:50
But if somebody, but if somebody put it to three then, I would be like, well, it's, three it is.

Researcher 8:55
[Laughs] Here we go!

Participant 002 8:56
Yeah, here we go!

Researcher 8:57
Okay. What about the negative? What was most frustrating about the experience?

Participant 002 9:06
Just what I was saying earlier, just the charge, and carrying that on my wrist.

Researcher 9:12
Gotcha.

Participant 002 9:13
I wouldn't want to take it off at night, um, because I wouldn't want to forget it in the morning, so I had to sleep with it. And I think that was the most frustrating part.

Researcher 9:19
Oh, okay. Gotcha.

Participant 002 9:21
Yeah. And that's more of a personal thing, obviously, but it was just, I wasn't used to having something on my wrist.

Researcher 9:26
Sure. Is there anything we could improve or change to make this intervention more effective at increasing how much you walked every day?

Participant 002 9:38
Um, I think just knowing the steps. Being aware of how many steps you're taking would have helped me, so I can maybe try to beat my, you know, the previous day's count.

Researcher 9:52
Gotcha. Yeah, that makes sense. Anything else? What about, like, the tone of the messages? Were they too cheerful or was it okay?

Participant 002 9:59
Oh, no, no. That was great.

Researcher 10:01
K.

Participant 002 10:01
Yeah, those were wonderful. I don't even know how you came up with so many ways of motivating me to get up. [Laughs] Those were great.

Researcher 10:07
Awesome. I'm trying to think, is there anything else you want to tell me about the experience?

Participant 002 10:15
Um, you know what, a few times that I missed my text messages was because I was focused on my work. Maybe if there was a different method of delivering the message, uh, whether that be email, or just a different form, or maybe the phone ringing.

Researcher 10:34
What about like, what about Slack? Would Slack be good?

Participant 002 10:38
Yeah, that would have been great. That would have been amazing.

Researcher 10:42
Oh, really? Okay. Why is that?

Participant 002 10:44
Well, because I'm constantly looking at it. And I'm not really looking at my text messages when I'm at work.

Researcher 10:49
Right.

Participant 002 10:50
That's almost the reason why it kind of, um, helped that I had [coworker name redacted] next to me, because he would remind me. Because there was a lot of times where I wouldn't even see my phone, and he would remind me that we got a text, that's what would get me going.

Researcher 11:04
Did you have your phone on silent most of the time?

Participant 002 11:08
Um, I think most of the time it is on silent. But even if it was on vibrate—I keep it on, at least on vibrate at the very least, but I wasn't getting it.

Researcher 11:18
Okay.

Participant 002 11:19
I wasn't being notified by my phone.

Researcher 11:22
Gotcha. Aside from the fact that, like, [coworker name redacted] would remind you, um, do you think that there was a benefit to the social component?

Participant 002 11:36
Absolutely. If it was a group thing where everybody was getting notified in Slack to walk together, that would be a thing that I wouldn't miss.

Researcher 11:48
Gotcha.

Participant 002 11:49
Because in the back of your mind, you almost feel like it's a group thing, right?

Researcher 11:51
Right.

Participant 002 11:52
It's a team effort and you don't want to let your team down. So even though they probably wouldn't care, but, uh, it just seems like a team effort. A way to maybe talk with your co-workers in that kind of atmosphere. It's, it's really helpful.

Researcher 11:52
A little more fun?

Participant 002 12:10
Yeah, a little more fun.

Researcher 12:17
Thinking about how we could have made this just kind of—because, right, this was like the first pass, right? This was the first study we did. It was really rigid. You weren't able to pick the times, you weren't able to pick the type of text, you weren't able to pick the frequency, like, you weren't able to pick the format. Is there anything else you would want to like, customize or tweak to make it fit your schedule better, other than the stuff you mentioned already?

Participant 002 12:41
No, the timing is fine. There's never a good time which is, which is probably the best thing about you picking the times, because it was it was just sending me to walk those certain times. If I had to pick I probably wouldn't be able to pick a set time. Um, but it's just the delivery of the message I would've probably changed.

Researcher 13:03
Awesome. And what about like, the fact that it was during work? You said you liked that

it pulled you away from work.

Participant 002 13:11
Right.

Researcher 13:11
But sometimes you were in meetings and you weren't able to go away.

Participant 002 13:15
Mmhm.

Researcher 13:16
Would you want a reminder during lunch or after work?

Participant 002 13:21
Yeah, that would have been great. Like, so if I wasn't able to make one walk then that reminder gets pushed into the evening, maybe. That would have been, that's a good idea.

Researcher 13:30
Okay, cool. So like, one—so what time would you say would be like ideal, like for the—if you keep it at two messages? What would you pick do you think?

Participant 002 13:42
Well, I would say 7pm, because I know I'm at home by then.

Researcher 13:47
Cool.

Participant 002 13:48
It's probably right after dinner.

Researcher 13:50
Gotcha.

Participant 002 13:51
So yeah, that'd be great. Yeah, little walk before. Because, you know, obviously, a lot of times I just have dinner. I just sit down. But it would be nice to be notified and just do a little walk.

Researcher 14:02
Gotcha. Cool

Participant 002 14:05
And maybe if it was three times a day, then that would be the ideal time for the third one.

Researcher 14:09
Okay, cool.

Participant 002 14:10
With two at work, and then and then the third one after dinner.

Researcher 14:14
Would that one needs to, like if that one was Slack, would you get it? Would you see the Slack message at night or would that one need to be text?

Participant 002 14:20
Yeah, see that, that third one, I would probably get it on text. But even if it was on Slack, though, if that was the only method of delivering the message, I would still get that.

Researcher 14:29
Still get that? Okay.

Participant 002 14:30
Mmhm. And then I'm wondering if, if it would help me to have either snooze it or to accept it.

Researcher 14:40
Oh, that's a good idea.

Participant 002 14:42
You know what I mean, like, if I would, if I had to decide do I want to keep snoozing it every five minutes, or do I just want to go ahead and do my walk? Maybe that would have motivated me just to do the walk.

Researcher 14:54
Right.

Participant 002 14:58
Because that kind of commits me to do the third walks no matter what, it's just a matter of when. So that gives me the flexibility of like pushing it back if I had to, if I was in a meeting, but I would also have to commit at some point. So I would definitely do that walk the three walks per day.

Researcher 15:15
Awesome. Anything else?

Participant 002 15:20
No. It was great. First time I was part of a study like that.

Researcher 15:26
Well, I really appreciate you helping me out, man.

Participant 002 15:29
Absolutely. Yeah, get your master's. [Laughs]

Researcher 15:35
Okay, last question. So is there anything else you can say about what having a co-worker or group of co-workers get the text affected you?

Participant 002 15:49
How it affected me, or?

Researcher 15:51
Yeah.

Participant 002 15:52
Yeah it affected me in keeping myself on track. Because it was, it would be easy for me to ignore the text messages and just, you know, nobody knows why I just got a text message, it's fine, nobody cares. But if other co-workers are getting the same message I'm getting, then it kind of, you know, motivates me to get up and actually do the walk with them. And again, it's, it's like a whole group thing, right? It's a group activity. So it's not just something you do by yourself, which wouldn't be that bad either. Right? And a couple times, I did do it by myself. But it's more of like not letting everybody else in the team down and doing it as a group activity.

Researcher 16:34
Perfect. Awesome. Thank you so much, [name redacted]. Appreciate you.

Participant 002 16:37
Thanks, [researcher name redacted]. No problem, man. Bye.

Researcher 16:39
All right. Take care.

CASE #07 (GROUP MEMBER) INTERVIEW TRANSCRIPT

Researcher 1:24
Hi [name redacted].

Participant 007 1:29
Hello.

Researcher 1:30
How's it going?

Participant 007 1:32
Good. How are you?

Researcher 1:33
Good.

Participant 007 1:33
Did you just join or did I just join?

Researcher 1:34
Uh, both maybe? I just joined.

Participant 007 1:40
Okay.

Researcher 1:44
So the experiment ended a while ago so apologies for that. It has been too long, but moves happen. Um. But basically I just want to talk about your experience. What went well, what went poorly, what we could change in the next iterations of this to make the intervention more successful. Basically, to make you walk more steps. So let's start by just having you tell me about what your experience was like, in general, just sort of—you remember it was like six weeks, we had the two weeks of just wearing the Fitbit and then four weeks of getting the two texts each day. Tell me what your experience was like.

Participant 007 2:25
First off it flew by, which surprised me. Six weeks sounds like a long time. So I was sort of expecting like, there would be a point where like, it would register, and I would actually like respond. But every time like I got a text or whatever I'm like, "Ugh, I have a meeting, or I have to get this done," and all of a sudden it was over. So I was really surprised that I didn't adapt and respond to it in that time frame. I don't think I really did. Like very rarely did I feel like—well, two things: very rarely did feel like I had my phone on me to like, notice the check, or the text, when it happened, but I think that was also [mic cuts out] around when this—

Researcher 3:09
You broke up for a tiny bit, what was that?

Participant 007 3:11
It keeps switching my default mic on me and I don't know why.

Researcher 3:14
Oh weird. Okay.

Participant 007 3:16
I feel like when this started, work like picked up huge for me. So like side note of it, like it kind of made me realize how when work picks up how little control I feel like I have over my schedule, because in practice, it would sound like, "Yeah, I can get a text and leave my desk and go for walk, I have a super flexible job, right? Like no one cares when I come or go or whatever. But like in practice, I felt like I was very tightly controlled by meeting schedules, and daily schedules, right? That was kind of surprising, like eye opening. Like, I thought I could just get up and go for walks like a lot easier than I could.

Researcher 3:54
Yeah. Okay. So what was the typical experience like when you got a text message, did you—you said you typically didn't have your phone on you so you'd just like see it later in the day or...?

Participant 007 4:07
Yeah, I would usually see it later in the day.

Researcher 4:10
And what would happen if like—if you did receive it, like, what was that experience like?

Participant 007 4:18
A handful of times I would use it as a get up reminder. And only like, a few times did I actually get up and go walk.

Researcher 4:27
Okay, gotcha. And was there a change in your response over time? Or was that pretty consistent throughout?

Participant 007 4:36
I think that was pretty consistent. I think like it was either my day, it was mostly influenced by, um, what was on my plate that day. Right? And the weather. [Laughs] Like if it was too cold, I'll just go get a drink downstairs and call it good. Right?

Researcher 4:54
So do you think you would say the text messages like rarely influenced how much you walk?

Participant 007 5:09
Like, they influenced the—I don't know. It's a good question.

Researcher 5:18
You think it was like, once or—

Participant 007 5:18
No, I think they would influence it. It didn't mean I did, because it didn't control those other two factors, but it made me consider it, so there was an influence.

Researcher 5:27
Okay, so they were— you were thinking about walking more.

Participant 007 5:30
Right when I would get it I'd be, have to think. "Can I do it now or not?"

Researcher 5:34
Do you think that the texts changed how much you walked per day?

Participant 007 5:44
Mmm...probably not.

Researcher 5:45
Okay. Did you have any social support like family or peers or others that helped encourage you?

Participant 007 5:55
Yeah, like it was super helpful to realize that people around me were going for a walk. I'm like, "Oh, yeah. check my phone. Oh, yeah, a text came. Let's go!" Like that was really cool.

Researcher 6:04
And on those—

Participant 007 6:04
Especially for someone like me who isn't watching their phone. To see other people getting up and like, oh—that was a good cue.

Researcher 6:12
Okay, gotcha. You think like that, the social component, influenced your behavior?

Participant 007 6:18
Yeah.

Researcher 6:19
So on those occasions, do you think you walked more on those times when you noticed like other people getting up?

Participant 007 6:26
I think so.

Researcher 6:30
What did you enjoy most about the experience?

Participant 007 6:41
I don't know, it was fun. Like, uh, the text messages were fun to get. Like I like—like it made sense with like my mental model of who I thought I was and who I want to be: someone who gets up and goes walking during the day. Yeah, I like that, let's do it! Like, so I kind of liked those reinforcements, even though I wasn't actually doing it, if that makes sense.

Researcher 7:02
[Laughs] totally.

Participant 007 7:03
Like this reflective sense of self coming at me in these text messages and I'm like, "Yeah, I'm a person who does that!" as I don't. Right?

Researcher 7:12
And what was most frustrating about the experience?

Participant 007 7:17
Uh, I hated getting it at the end, or like during a meeting and being like, "I would love to not be in this meeting and go on a walk right now," [laughs] and just feeling like I was stuck somewhere. That was the most frustrating part.

Researcher 7:31
Did that happen pretty regularly?

Participant 007 7:34
I feel like I reacted strongly to it, so I remember it more, but I can't I don't know if that influences how I remember the frequency but I can vividly remember multiple times that happened.

Researcher 7:44
Uh huh. Oh my gosh. Kitty is being so affectionate right now.

Participant 007 7:49
That is a furball kitty.

Researcher 7:51
I know and she, her fur is like getting in my mouth.

Participant 007 7:54
Oh no [laughs]

Researcher 7:58
So what about the, like—thinking about, like, how we can improve this for future iterations? Like, how can we make people walk more? What could we improve or change to make the intervention more effective for you?

Participant 007 8:16
Um, probably allowing me to look at my calendar and say, "This is when I want reminders. Like these are when I won't be trapped in meetings on a pretty regular basis. Usually, if I am going to have, to be able to walk today, these are probably the time so like, I make sure I have a cue to try to go during those times.

Researcher 8:35
K. Yeah, it seems like it would almost be awesome to have like, reminders that dynamically adapted to your calendar Right? Like—

Participant 007 8:42
That would be perfect

Researcher 8:43
Like there's no reason to get them like during a meeting, right?

Participant 007 8:46
Yeah. Or like, right after a meeting, right, like before I [mic cuts out]

Researcher 8:52
Muted again, what was that last part? [laughs]

Participant 007 8:55
Like [laughs] like right after a meeting where I settle into a new thing. You know I've been sitting for an hour, that's a perfect time.

Researcher 9:01
This is the perfect time to take a little walk.

Participant 007 9:03
Yeah. As opposed to like in the middle of my only chunk of head's down time or something, right? I'm gonna be like, no.

Researcher 9:10
Yeah. Because—okay, so the two things that really inhibited you were, it sounds like, being in a meeting and then just like workload in general, right?

Participant 007 9:19
Yeah.

Researcher 9:21
Would it have been better to have like, the reminders take place like before work, during lunch, or after work, as opposed to at the times they came?

Participant 007 9:35
After work? Maybe, but like during that time, lunch and before work, were busy times.

Researcher 9:43
Do you think that if, so, if we had this like dynamically adapting messaging or—if you were just allowed to like pick the messaging times would that have been a good thing? Like—

Participant 007 9:56
Yeah, either those would be great. Dynamic would be preferred. Right? Because that was one of the cool things about it, is I didn't have to think. They just came.

Researcher 10:03
Right. Yeah. What about, um, format of delivery, getting a text message? Would it have been better to be in a different format?

Participant 007 10:14
Because I am at work and not as much on my phone, probably getting a Slack message.

Researcher 10:21
Um, what about, um, the, like, tone of the messaging? Was that okay?

Participant 007 10:30
Yeah, I loved those. Yeah.

Researcher 10:34
And what about the frequency? How many times per day?

Participant 007 10:37
I think frequency is good. It was two times a day, right? Morning and afternoon? Yeah, I liked that.

Researcher 10:47
And what about the fact that it was on just the work days?

Participant 007 10:52
Yeah, I like that too. I think, because the weekends are just all over the place.

Researcher 11:02
Any other feedback that you have about improving it or what worked or what didn't?

Participant 007 11:12
I think I'm super curious to read like the results like how it's looking up, but like, in, like in my last job. I worked at a place that had similar climate issues, right, where it could be cold or hot. But there was a specific place to go walking outside. Like the campus had a botanical garden with walking paths on it. And so like, it—everyone is like expected to go walk in it all the time. Like we have this thing right there. It's like having a distinct place to go. I'm realizing really influenced me as opposed to here. That was—so like time to go, not so bad. But like, where to walk? You can kind of walk, like there's Thanksgiving garden, Point right there. But if I didn't want to walk that, quite that far, whatever, right? You have to like, kind of like, think about where to go. Where was I going with this? Oh! But more so than having a place to go, people to go with. Like I have co-workers here, but they aren't operating on the same schedule and frame of deadlines as I am. So if I were directly working, sitting with people aware of my team, and I could use that time. Okay, I've been working on this all day, I could use that time to talk and walk. And I feel like it'd be a lot more easy for me to go.

Researcher 12:24
I see. So being in close proximity to people was helpful, but not as helpful as if you guys were actually on the same team.

Participant 007 12:32
Right. Because I would still use that time to talk over ideas or something,

Researcher 12:37
Right. That makes sense.

Participant 007 12:40
Because I don't feel like I need walks as a mental break all the time.

Researcher 12:48
Yeah.

Participant 007 12:50
Like, it really is more for exercise.

Researcher 12:54
Yeah.

Participant 007 12:55
If that makes sense. Because if I need it, like—you would think that during a time when my workload was increasing dramatically, I would want and need mental breaks and appreciate the walks more than ever. But it didn't play out like that. Like I wanted to continue working at my desk and figuring out a problem. And I took breaks in different ways. Smaller ways. So that kind of surprised me, right? Like you would think. My idea of who I am is someone who would take these mental breaks, but that's not how it played out.

Researcher 13:21
Yeah. Well, I mean, that totally makes sense. When you like are in flow, you don't disrupt that, right?

Participant 007 13:30
Mmhm.

Researcher 13:30
Can you tell me about a time that the texts worked. What happened, what it was like, what the factors you think were that influenced it?

Participant 007 13:42
Yeah, they'd be like, when I'm not in the middle of something, right? When I'm not in a meeting. Um, and usually it probably would be, honestly for me, like my most important meetings, um, would be front loaded in the morning. So I would feel like way after noon, like, yeah, I can take, I can take the break. But if my important meetings were in the afternoon, like I wouldn't break in the morning. So if I got my most important thing done already, then I'd probably feel like oh yeah, this totally works. Like your one on one with [manager's name redacted] gets canceled: "Yeah, I can totally go for a walk." [Laughs]

Researcher 14:15
[Laughs] Right, right.

Participant 007 14:18
"Okay, that's fine."

Researcher 14:21
Cool. I like the—okay, so the note about like, weather is interesting. So if it was just like cold or windy or rainy that would inhibit you?

Participant 007 14:31
Yeah.

Researcher 14:35
And then also the environmental aspect, right? Like, having a

Participant 007 14:40
Sorry you cut out.

Researcher 14:41
You're fine. So like have the environmental aspect, having a dedicated place to walk with you nearby—

Participant 007 14:49
Sorry, hold on.

Researcher 14:51
You're fine. Can you hear me? Mic check, mic check. Can you hear me?

Participant 007 14:58
Yeah, I can't hear you, hang on. It like, is spinning.

Researcher 15:16
Can you hear me now? Mic check.

Participant 007 15:20
Ok, can you hear me?

Researcher 15:22
Yeah, I can hear you. Can you hear me? Can you hear me?

Participant 007 15:31
Hello?

Researcher 15:33
[Participant name redacted]? Hello? Hello? Mic check mic check. Nothing, huh? I can't hear you anymore.

Participant 007 15:54
Oh, you're back!

Researcher 15:56
I'm back? You can hear me?

Participant 007 15:57
I can hear you. Yeah.

Researcher 15:59
Awesome. So I was saying that there's like, there's also this like environmental component where you feel like if there's like a dedicated place to walk that can influence you, right?

Participant 007 16:06
Mmhm.

Researcher 16:08
Okay, cool. So, last question is, can you tell me how being around other people getting the text message influenced you?

Participant 007 16:26
Yeah, like if I saw people in response to that, it made it a lot more enjoyable because it's fun to go walk with people, as a social break, not so much a mental break, right? It'd be more fun to go walk with people then walk by myself. I don't really have more on that. Not really a deep thought, but. [Laughs]

Researcher 16:49
No, that's great. Awesome. Is there any other feedback that you have, any other things that you want to share?

Participant 007 16:54
It was fun. It was cool. It was kind of surprising, yeah, realizing how little I walk when I think I'm someone who does. [Laughs]

Researcher 17:06
[Laughs] Well, thank you so much for doing it. I really appreciate it and I will be sharing all the results with you as soon as I finish writing them all out.

CASE #13 (GROUP MEMBER) INTERVIEW TRANSCRIPT

Researcher 0:38
Oh my gosh [participant name redacted], I'm so sorry! My meeting went long. I should have slacked you.

Participant 013 0:43
No, it's all good.

Researcher 0:44
How are you doing?

Participant 013 0:46
Good, how are you?

Researcher 0:47
Pretty good. Um, It's fun [recording skips] K, so basically I just want to talk through, like, what your experience was like, and, um, find out what worked for you, what didn't work for you, if you felt like the treatment was effective or not effective, and what do you think we could change to make it more effective. Like, this was the first round, right? So hopefully if we do this experiment again, we can make it work even better, meaning make people walk more, right?

Participant 013 1:18
Yeah.

Researcher 1:20
So let's—if you remember, we did, it was a six week experiment. The first two weeks, we just had to wear the Fitbit, then the next four weeks it had the messages going twice a day, right?

Participant 013 1:29
Mmhm.

Researcher 1:29
Um, so if you can just start by telling me, overall, what was your experience like?

Participant 013 1:37
Uh, so I already wear a Fitbit, so I was just wearing two Fitbits. One would give me my normal notifications and the other one didn't. [laughs] Um, and then with the notices on my phone—so I don't really keep my phone, like, with me, like I don't have pockets. I have, you know, girl pants which don't have pockets, so I never even saw the text, really. It was pretty rare that I even noticed them.

Researcher 2:00
Okay, cool. So, what, so for the most part, you just didn't see the text until like later when you got to your phone or whatever, right?

Participant 013 2:13
Exactly, yeah.

Researcher 2:13
Ok, gotcha. Do you just keep your phone at your desk, or...?

Participant 013 2:17
Yeah, it's on my desk or in my bag or just laying somewhere on vibrate.

Researcher 2:21
Ok, gotcha. Um, so, when you did receive a text message, thinking about that experience, can you walk me through sort of what that looked like, when that did occur?

Participant 013 2:32
Um, I'd notice the text and I'd say, "oh, it's for that study I'm in," and [laughs] so that was about it.

Researcher 2:39
Gotcha. So did it, um, like did it influence your behavior at all? Do you think you walked at all anytime when you got the text or was it mostly just like, not effective?

Participant 013 2:49
Uh, like sometimes I'd be like, "Yeah, I would like to take a break." And since I knew other people were doing it, I might be like, "Hey, let's go take a break." But it was usually like in meetings or just some timing where I couldn't.

Researcher 3:02
Okay, gotcha. Um, so you said that like, um, because you knew that other people were in it, you would sometimes say like, hey, let's take a break. On those occasions, you guys would go on a walk together?

Participant 013 3:14
Um, I can't remember if we ever actually did or if I was just like, "Yeah, I could take a break" and then I'd look around and I'm like, "oh, everyone else looks busy. Nevermind." [laughs].

Researcher 3:22
[Laughs] Ok, gotcha. But there was, uh, some—

Participant 013 3:28
Yeah, the social aspect was, would have definitely been, a greater effect. Just knowing that other people were doing the same program.

Researcher 3:36
Gotcha. Cool. Um, and did your like—so you mostly didn't see the text messages or when you did you were too busy to like, go on a walk. Did that change over time? Or was that consistent throughout the study?

Participant 013 3:48
I'd say it was consistent the whole time.

Researcher 3:49
Did you notice any sort of difference in your behavior or the experience of getting the text from the beginning to the end?

Participant 013 3:58
Not that I remember.

Researcher 4:00
Cool. Um, so did you ever go on a walk because of the text?

Participant 013 4:11
Ah, maybe.

Researcher 4:14
Maybe? [laughs]

Participant 013 4:16
I mean it wouldn't have been like a super consistent thing.

Researcher 4:18
Right.

Participant 013 4:18
It was just that, I've got a convenient excuse to go.

Researcher 4:21
Safe to say, rarely influenced your behavior.

Participant 013 4:25
Yeah, it's like if there's, if I have free times during the day, it's kind of already a set thing. Like the text wouldn't cause a difference, like it's—the text isn't giving me sudden free time, you know?

Researcher 4:35
Right, right. Um, are you the type of person that already, like, goes on walks regularly, or...?

Participant 013 4:42
Yeah, because like, I already do.

Researcher 4:44
So when you have free time, you're already kind of going on walks. Okay, okay.

Participant 013 4:46
Yeah, I'm like, uh, I'm gonna go out and like get a coffee, or like I do yoga and like the gym every day, so I'm already getting that in somewhere.

Researcher 4:54
Gotcha. That makes sense. Um, do you feel like—so talk about the social component a little bit, did that, so you said, like, that maybe would have tipped the scales a little bit towards trying to take a break.

Participant 013 5:07
Yeah. So we used to do a lot of team walks in engineering. Like we had a project manager a long time ago. [Project manager name redacted], you remember [project manager name redacted]?

Researcher 5:17
No?

Participant 013 5:18
[Coworker name redacted]'s wife?

Researcher 5:21
I—no, she quit before I started. I only know her because I'm in like, a Slack, like, group with her for like Utah tech people.

Participant 013 5:30
Oh, cool.

Researcher 5:31
She was like, "Oh, my husband's starting at DigiCert." And I was like, "Oh, cool." But that's funny. Okay, so,

Participant 013 5:35
Yeah, so—

Researcher 5:36
I've never met her in person, but yeah.

Participant 013 5:38
—yeah, when she was here, she basically just got into this thing where she's like, "New pathways! You have to do something different every day." So she'd just come by and like, make everybody on the team like, "We're gonna get up and we're gonna go walk and we're gonna go like pet the ponies at Thanksgiving Point or whatever so she was like super demanding that we like get up and do something every day." [laughs] And I was like, "I like that." So we like kept that up for quite a while, where maybe once a day like

the CertCentral team with [coworker name redacted] used to do it, like, once a day everyone would get up and walk over to 711 when we were in the other building and get Cokes, like in the morning and in the afternoon. But it kinda, it kind of fell away.

Researcher 6:15
Yeah. So—

Participant 013 6:17
That's why I thought about like, "Hey, I could bring that back. I could grab people, we could go," but it never worked out.

Researcher 6:23
Why do you think it didn't work out?

Participant 013 6:26
There's just always something else happening, like people are already—

Researcher 6:28
K

Participant 013 6:28
—doing lunch or people are like around the whiteboard, like doing something. I was like, "Nah,"

Researcher 6:32
Mm.

Participant 013 6:32
"I'm not gonna interrupt."

Researcher 6:33
Gotcha. Do you think that like, um, was it just because like meetings were scheduled or the workload in general? Or like the timing of the messages or the frequency of the

messages? What do you think like, would have changed it?

Participant 013 6:49
Yeah, I don't remember what the timing of the messages was. If it was like, at lunch, or in like the middle of lunch?

Researcher 6:56
It was like I think, so it was either 11 or 11:30am and then 2 or 2:30pm, each day.

Participant 013 7:02
Okay, yeah, so with the Mountain View team, like, that is the block. Like the only time

we can meet with them is 11 to noon.

Researcher 7:09
Oh, okay.

Participant 013 7:09
And then like 1 to 3. So that's—

Researcher 7:11
Oh, really? [laughs]

Participant 013 7:13
—when the messages tended to be.

Researcher 7:13
Okay, gotcha. [laughs] Okay, um, so timing of the message, what about frequency of the messages? Do you think two times a day is a good pace for you? Like,

Participant 013 7:23
Yeah.

Researcher 7:24
Do you think that like, I mean, I don't know, are you sort of like, you need to find a random point in time throughout the day to go on a walk and the messaging is not going to affect you at all? Or do you think that like, can you conceive of a situation where like getting some type of either slack message or push notification or text reminder would maybe influence your behavior? Or is that just sort of like, eh, that wouldn't really work for you?

Participant 013 7:48
Yeah, um. I'm trying to think. Like on the typical day there are times where it's like, kinda late afternoon and like everyone's kind of like, “I'm tired, I need a break. I need

whatever.” So if I was to—

Researcher 8:00
Yeah.

Participant 013 8:00
—get that, that would make sense.

Researcher 8:02
Would that be like a—

Participant 013 8:04
[unintelligible] super random and chaotic, and I—

Researcher 8:06
Yeah.

Participant 013 8:07
—don't know if there's a steady time that would work.

Researcher 8:10
Gotcha. So, in some of the other interviews, we talked about, like, so people were saying, "well, we don't have like, I don't have my phone with me, but I'm at my laptop a lot. So like a slack message will work better." Would that have worked better for you?

Participant 013 8:23
Yeah, that would have. I pay attention to Slack, I don't pay attention to my phone.

Researcher 8:26
Right. Yeah. That's seems to be consistent. And then we also talked about maybe having it, like the reminder, dynamically change based on your, like, Outlook schedule. Like if it notices you have like a half hour free in the afternoon, then that's when it pings you.

Participant 013 8:46
Yeah!

Researcher 8:47
Whereas it's stupid if it pings you during a meeting, right? Like...

Participant 013 8:51
Yeah, I'm like, "Sorry, guys." [laughs]

Researcher 8:53
Right. [laughs]

Participant 013 8:54
"Be back in ten." [laughs]

Researcher 8:55
I know, [laughs] "You guys keep talking, I have to walk." [laughs] Okay. Cool. Um, what about like, so—and some other people said that like being able to set the time themselves would have worked. But for you, it sounds like your schedule changes enough that you wouldn't have like a specific time that worked, right?

Participant 013 8:55
Yeah, I mean if I did set it myself I might be like 3pm, 3:30, like that.

Researcher 9:18
Okay, just after, like, the Mountain View block of availability?

Participant 013 9:21
Yeah, yeah exactly.

Researcher 9:22
Okay. That makes sense. Um, did you feel like there was any social support for you in this, like family or peers that encouraged you?

Participant 013 9:34
Um, I know some of the people around me were doing the same study, but I don't really remember them talking about it too much other than, uh, a lot of us got a lot of comments about, "Oh, you're wearing two Fitbits, why?" [laughs]

Researcher 9:51
What about, so, what did you enjoy most about the experience? What, if anything worked?

Participant 013 9:58
Um, if I had been more dedicated to like, "Oh, I'll bring back team walks," that would have been really fun. But that was just on my part, I never did it.

Researcher 10:07
Okay, cool.

Participant 013 10:08
I had great intentions to bringing them back and then I didn't.

Researcher 10:15
Do you feel like, so talk a little bit more about like the social component, about like the idea of a team walk, why do you think that might have been helpful for you?

Participant 013 10:24
I think it's just easier to do things in a group than trying to do stuff by yourself. And then it kind of doubles as like, oh, team building. Like you're talking with your teammates getting to know them better, and that's kind of work related in itself.

Researcher 10:40
For sure. Um, what about, what was most frustrating about the experience?

Participant 013 10:47
Um, the app on Android sucks. And just trying to get it to sync. I had an iPhone before and I never had a problem but I mean, it's the same with mine. I have to just fight with it to get the data to move over.

Researcher 11:02
It was—like pause on the interview for a second—it was so frustrating to like, deal with these old devices.

Participant 013 11:09
Yeah, I'd imagine. I'm like, "Man, if I'm having a struggle, I can only imagine what you're dealing with." Didn't you have like 30 people doing this?

Researcher 11:18
Yeah, it was so crazy. And like people would lose it, and it would just like stop syncing. And like the battery would just poop out on some of them. So I had to—and I had people all the way up like, like, two hours north of Salt Lake in some town that I don't even remember the name of all the way down to like Spanish Fork participating. So I was just like driving around replacing Fitbit and like, frantically ordering new ones on eBay and stuff. Anyway.

Participant 013 11:42
Oh, that's painful.

Researcher 11:44
Um, so what else can you think of that would, like that we could change about the intervention, anything about how it took place, that would make it more effective at increasing how much you walked each day?

Participant 013 12:02
Um, nothing I can think of, maybe if there was some kind of like, goals or leaderboards or like some kind of competition aspect where we see how much others are doing.

Researcher 12:13
Okay, cool. Um, that's a great idea. Do you think it would be, like if you had a, like, individual leaderboard or would it be good if you had like two, like, groups in the office?

It was like the engineering team versus like the QA team versus like, the designers or something?

Participant 013 12:30
Yeah, if it were like, versus different departments that would have been cool—

Researcher 12:34
That sounds fun.

Participant 013 12:35
—like competitive.

Researcher 12:36
Yeah. Um. Anything else? Was the tone of the messages obnoxious?

Participant 013 12:46
I didn't think so.

Researcher 12:47
Good tone?

Participant 013 12:48
Yeah, I didn't feel like that was obnxious.

Researcher 12:49
So tone and frequency was ok. Okay.

Participant 013 12:50
I was like, "Oh, it's like a happy message!"

Researcher 12:53
Yeah? Okay, cool.

Participant 013 12:54
I thought they were good.

Researcher 12:55
Cool. What about, um, would it have been better if it took place like before work, or during lunch, or after work?

Participant 013 13:04
Uh...

Researcher 13:06
Like do you like the idea of a text, or let's say slack message, let's just go with slack message. Do you like the idea of a slack coming like, not during the, you know, Mountain View meeting hours, but like just still during the work day, or would it be better to like, I don't know. I initially thought like, let's have a like a message at lunch because everybody's off at lunch, then you can go on a walk but, um, ended up going with like, mid-morning, mid-afternoon because like, that's when people kind of need a break, you know?

Participant 013 13:39
Yeah [unintelligible]

Researcher 13:39
but I don't know, what would have worked for you?

Participant 013 13:41
If they were just a tiny bit later in the afternoon, that would have been—

Researcher 13:44
Yeah.

Participant 013 13:45
—perfect for me

Researcher 13:46
Cool. K. Is there anything else you want to share? Anything else you can think of about the experience that might be helpful?

Participant 013 13:55
Um, not that I can think of.

Researcher 13:58
So we've got like, wearing two devices is not ideal, the app was annoying. What about like charging it? Like—

Participant 013 14:05
I think that was fine, for me.

Researcher 14:07
That was fine?

Participant 013 14:07
Yeah.

Researcher 14:07
Okay, cool. And having to like, remember to like put it back on, that was fine for you?

Participant 013 14:13
Yeah. Uh, I would say, like I started wearing a Fitbit, like years ago or something, and it drove me crazy for a while just because I wasn't used to like having something on.

Researcher 14:21
Right.

Participant 013 14:22
If I wasn't already used to dealing with that. I probably would have struggled, but I was just like, "Ah, I'm charging my other one I'll charge this one too." Like—

Researcher 14:28
Yeah

Participant 013 14:28
Not a problem.

Researcher 14:29
K, cool.

Participant 013 14:30
I already developed the habit.

Researcher 14:32
Right. Cool! Okay. Well, that's all I got for you. Thanks so much for like doing this study in the first place. And then also doing this interview. Super helpful.

Participant 013 14:42
Yeah, no problem. Good luck!

Researcher 14:43
Thank you. All right. Talk to you later!

Participant 013 14:45
See ya!

Researcher 14:47
Bye.

CASE #22 (LONE PARTICIPANT) INTERVIEW TRANSCRIPT

Researcher 0:32
That was—good, okay, so um, let me just pull up my document. Um, but basically, um, I just want to go through and find out, like, what your experience was like in your own words, um, sort of from start to finish, and then, um, what worked for you and what didn't work for you, if you feel like it had an effect on your behavior or not, and what we could—because this is the first iteration of this experiment, right? So like what can we do better next time to make it work, um, like the treatment work more effectively, right? Just basically how can we make you have more steps.

Participant 022 0:38
[Laughs]

Okay.

Researcher 0:39
So let's start with just you telling me what your experience was like.

Participant 022 1:24
Kind of like the whole thing or like a normal day?

Researcher 1:27
Talk me through the whole thing first.

Participant 022 1:29
Okay. Um, I was excited to be involved with it, just because I think I personally am interested in, like, habit building and what—and human behavior and what makes us do things we do, like what motivates us. So I was actually really excited to be involved in it. And I do not like wearing things on my wrist at all. Ever. So I don't even think I've had anything on—so I was actually nervous. I was like, "What if I forget one day?" So I was nervous. "What if I forget one day and then like [researcher name redacted] doesn't graduate?" And then I'm like, "No, this is scientific. That will actually be good, because I'm like a normal person." And then, yeah, I had been interested in like the, or heard—because I worked with Fitbit previously as a client, they were a client of ours at [company name redacted]. So just seeing like, how much, yeah, I don't know. Like, how many steps do I take? And like, what is kind of my average? Um, so I think that's all I kind of felt at the beginning excited to be involved, learn about myself.

Researcher 2:52
Cool. And, um—sorry, were you gonna say something else?

Participant 022 2:55
Oh, I just gonna say and it was pretty easy once I like—yeah, to keep the wristwatch on. I

was excited the first time I got like a notification. Um, and I was able to, like, get up and like, walk around. But then, um, my job kind of got increasingly, my workload got increasingly heavy over that time.

Researcher 3:17
Right.

Participant 022 3:17
And so I, I sometimes felt like, sad that I couldn't. So I'm like, "Oh, it's such a good idea. I know—I do feel like walking, I do know it's gonna make me feel better. But I can't do it." [Laughs]

Researcher 3:33
[Laughs] Were you like, was it the—you weren't going through a job transition? It was just the workload at your current position that was increasing. Is that right?

Participant 022 3:41
Yeah, well, I'd, so it's—yeah, the work. Uh, I added like a few team members in the summer.

Researcher 3:47
Okay.

Participant 022 3:48
I can't even remember exactly when we did this now. What was, what were the dates?

Researcher 3:54
Like November? No, October?

Participant 022 3:57
I don't know.

Researcher 3:58
I should know. This is embarrassing.

Participant 022 4:00
No, it's fine [laughs]. Um, I think yeah, I think that I just had like, my schedule became more meeting heavy.

Researcher 4:08
I think we started like October 7, I want to say.

Participant 022 4:10
K.

Researcher 4:11
I think it was the first week of October we started, and then it was six weeks. But I could be wrong.

Participant 022 4:16
Ok gotcha. Um, yeah, but I think it made me it like, also reinforced the fact that I really love, like walking.

Researcher 4:29
Yeah.

Participant 022 4:30
And I walked to and from the train station in Provo to work, and still do. Um, and I realized like this was, like, it's funny to see the steps but also like, I actually really enjoy, like, walking as part of my daily routine.

Researcher 4:46
Awesome. That's great. So let's talk then about the typical experience of so you remember there's like two weeks that was there was just like—oh, actually, I'm wanted to ask a follow up? So did you have a problem remembering it or remembering to charge it? Like, that was something I was super concerned about. Because like the devices had to be charged every single night, right? Like, was that something that you found difficult?

Participant 022 5:15
Um, I thought I would. Just because there's like a lot of things to remember in the morning.

Researcher 5:22
Mmhm

Participant 022 5:24
Um, but no, I knew that if I like just like put it right next to my bed, and there was like some blinky lights happening, it seems like, on it, which makes it pretty easy to not, like forget. Um, and there's certain things I'm like, "This is important to [researcher name redacted], so I gotta make sure I'm perfect every day!" The only time where I almost forgot it, because I was doing quite a little bit of travel during that time. But I ended up like remembering it so. It was the travel part that like, I probably would have slipped up on.

Researcher 6:05
Gotcha. That makes sense. I did have one person who like went to Australia and forgot it behind.

Participant 022 6:10
Yeah.

Researcher 6:13
Can you tell me about your typical experience getting a text? So if you think about, we have a text at like, I think was at like 11:30 and 2 every day.

Participant 022 6:19
Yeah.

Researcher 6:20
So what was it typically like when you received a text? What, just walk me through the

whole thing start to finish.

Participant 022 6:26
Yeah, um, so I'd get a text. If I was able to—our office, it's kind of circular downstairs, where I was sitting, and so sometimes I'd just like figure out what I was doing and see if I could just do it walking. And, um, I found like, I was most motivated just like immediately after getting the text. Um, if I for some reason saw it a few minutes late, I was like "eh, I'm like, not gonna walk now." But it was like, almost immediately when seeing it was the moment I felt like okay, this is great, let's go.

Researcher 7:09
Cool.

Participant 022 7:11
And then noticed in the afternoon for some reason for me, I seemed less likely to like, react to it. I just felt like, there were by that time so many other things going on, but I was like, "Aah! This can't be a priority." But in the morning, I was like, yeah, felt like motivated to get up.

Researcher 7:31
Cool. So, um, what about the environment you were in? You said it was circular. What about that environment affected your behavior in what way?

Participant 022 7:42
Um, so I've seen that—and I don't know if this is good or not, but I—some people have like walking meetings. Like I'll see two people. And sometimes I've heard them, it, they'll be like their one-on-ones, like walking, and sometimes I'm like, "That—I just heard something really private, that I probably shouldn't have." But I had never, so I was kind of averse to this thought of like, you know, you hold meetings walking, but it's so—and I've actually never kind of experienced the office as a track.

Researcher 8:14
Right.

Participant 022 8:14
But because it's so common, and other people are kind of like taking that pathway, I was like, you know what, like—so I'm more likely to go outside if I'm going to take a walk, but because there's already kind of established pattern of people walking around I thought, I don't think anyone will like, even though I haven't done it before, I think I can blend in if I just like, start walking around. [Laughs]

Researcher 8:40
[Laughs] Okay, so what when, like, you said that um, the afternoons you were less likely to walk. Do you have any idea why?

Participant 022 8:52
Um, I think for me and also—well most of the people I work with, are in California, so they're like an hour off. Um, so for me, just in general, the mornings are a lot lighter. And there's a lot more time for like me just to, like, make choices of what I'm doing. Where in the afternoons, I feel like that's when we tend to hold like, there's just more meetings happening or more like, of my team members are online and expecting immediate answers.

Researcher 9:27
Gotcha.

Participant 022 9:27
In a way that like, I felt more constrained.

Researcher 9:31
I see.

Participant 022 9:32
So I think I also in the afternoon, I have just like a lot more events going on in my, like—I've got to do things by the end of the day. Like it starts to get there.

Researcher 9:39
Right. That make sense. Um, and do you feel like you received most of the texts on time or missed—what like, do you have any sense of like, how frequently you were missing the texts? Like you said that like, if you didn't get it right away that you kind of like wouldn't walk, do you have a sense of how often that happened, and what might have caused it?

Participant 022 10:06
This was a while ago.

Researcher 10:07
I know, I'm sorry.

Participant 022 10:09
You know, I can't remember at this point. It almost just started feeling like—this is gonna sound very Pavlovian—but it almost just felt like at about 11 or whatever times they were coming, I just should start walking. [Laughs]

Researcher 10:26
[Laughs] Awesome.

Participant 022 10:29
I don't know if I got texts or not. But I was like, that's a really good idea like before lunch

to take a walk. So I can't remember the frequency.

Researcher 10:42
Do you feel like it—so are you saying it established a like routine?

Participant 022 10:46
Yeah.

Researcher 10:46
Okay, cool. So do you think that having it at a consistent time was beneficial or would it not have really mattered if it was at the same time every day?

Participant 022 10:57
Oh, I think for me, it's extremely beneficial.

Researcher 11:00
Really, okay, cool.

Participant 022 11:02
Yeah, I, I tend to—like my mornings are, like very structured.

Researcher 11:11
I see.

Participant 022 11:12
I'm not actually like a very structured person but for the things that I find like, for the things I prioritize, I want them to like have a consistent time.

Researcher 11:22
Yeah. Okay, so are your morning meetings pretty predictable?

Participant 022 11:29
Um, oh, I meant like my, my like morning routine. Like getting up, exercising, meditating, things like that are a little bit more rigid just because they're like, prioritized.

Researcher 11:41
Yeah

Participant 022 11:41
And then my mornings I actually for the most part, block them off.

Researcher 11:47
Oh, really? Wow.

Participant 022 11:48
Yeah, just I mean, my calendar. I just block it off because that's, um, like, more of a deep work time for me.

Researcher 11:57
I see. Okay, cool. So you didn't have the problem of like being in a meeting in the morning?

Participant 022 12:02
Mm mm.

Researcher 12:03
Like getting the text just being like I can't, I'm in a meeting right now. You're blocked off.

Participant 022 12:06
Yeah

Researcher 12:07
That's cool. How do you think—wait a second [name redacted] was flagging me down. Aww!

[pet rabbit gets on the couch and we talk about that for a while]

Researcher 13:20
Okay, so I was gonna ask you if the text message is influenced how much you walked on a regular basis?

Participant 022 13:40
Oh, yes.

Researcher 13:41
For sure?

Participant 022 13:42
Mmhm.

Researcher 13:43
Okay. Okay. And did that change over time? Do you feel like the first couple weeks you—I mean I could probably just look this up and see how much you walked

Participant 022 14:02
I think, I think I walked more the first couple weeks.

Researcher 14:05
Okay, cool.

Participant 022 14:06
Um, and then I realized again, I, I realized like, Oh, I really like walking. This is something whether or not I received a text that I definitely liked doing. So I think even if I wasn't able to walk at that time, I just thought about it more often. Like I am. I almost was like, more aware of like, "Oh, I'm walking," you know, or home and like racking up steps and yeah, I may not be able to do it at that time, like yeah, I think I just had an increased awareness to times I was walking.

Researcher 14:49
Um, what about social support? Did you have any family or peers or coworkers that helped encourage you during this experience?

Participant 022 15:00
Um, so my husband [name redacted] was the only one who knew about it. Other people were like, what do you have on your wrist? You never wear anything on your wrist. So I would tell them like what I was involved in but no one else was aware that I was like getting texts or trying to do anything. So no. And so because they happened at work no one at work was not necessarily supportive.

Researcher 15:31
Gotcha. Did you ever like go on group walks—

Participant 022 15:37
Um.

Researcher 15:38
—and like rope people into your walking?

Participant 022 15:41
I think probably only once. Um just like, it was a little bit colder outside. I think if it had been—huh. It made me think like I wanted to do group walks like it would have been more fun in some ways, um, but I didn't ever do it just because they're, like the little walking pathway is very, I mean, it's like, really only two people could fit there.

Researcher 16:12
I gotcha.

Participant 022 16:13
And then it seems like a little bit of a hassle to get out of the building because it's like, on the fifth floor, and then there's not really a lot of walking areas right around the office.

Researcher 16:25
Right.

Participant 022 16:26
So, I would have liked to but I—yeah, I would have liked you, but I didn't.

Researcher 16:30
Okay, gotcha. Um. How do you think involving coworkers or having a group walk would have affected you?

Participant 022 16:42
Um. I think it would have, um, let's see here. I think all of us had a, like, the same time when we were gonna do it, um, it would have been super—like it was something that I had just scheduled like, "Hey, everybody, two o'clock, let's walk," um, it probably would have helped me stay to it. Because I can tend to have—like, it can be difficult for me to, like, break away from work into something else.

Researcher 17:21
Right.

Participant 022 17:21
Um, but if I felt like these are the—especially if I felt like these are the people who would be counting on me anyways, like, and they're walking, um, I, it would have been easy to break away and walk with them.

Researcher 17:36
Nice.

Participant 022 17:36
So I think it would depend on the people. If it were the people that I work immediately with I think it would be really fun and really easy.

Researcher 17:44
Okay, awesome. Awesome. Um, what did you enjoy most about the whole experience?

Participant 022 17:52
Um, I think I enjoyed just, like, being part of the research, because I wasn't sure what it was about, but I was like, I don't know, just interested in seeing what you learned. Um. So I think that was the first thing, and then second is just again, like, just acknowledging that it actually feels really good to like, get up and move throughout the day. Um. Yeah. So those two things.

Researcher 18:19
Cool. And then what about frustrations? What was not fun about the experience?

Participant 022 18:26
Seeing the text and like, knowing I couldn't do it. Like, failing. Feeling—yeah, failing my Fitbit.

Researcher 18:37
U, and I think you already covered some of the reasons why, like afternoon meetings or just increased work chatter. Was there other stuff that might cause you not to walk?

Participant 022 18:53
Um, I think for me, it was also knowing that like, there was just a better time to walk. Like that I already have, you know—I guess I didn't feel like, yeah, that was my only chance to do it. Um, so, yeah. But yeah, mostly it's just busier in the afternoons.

Researcher 19:16
Gotcha. Um, so thinking about what we could change about the intervention to make it more effective or more pleasant or just better in any way. Is there anything that comes to mind off the top of your head that might just be a fix for you?

Participant 022 19:42
Um, you mean that would have made like the whole experience better, or that would have caused me to, like, have the behavior more?

Researcher 19:58
I think like mean, sort of with the goal of increasing physical activity—increasing walking, right, just increasing step count. That's the goal of—the assumption is sort of like, anything we do to improve the experience as a whole would make you more likely to be susceptible to the intervention, but I don't know. Yeah, maybe. But yeah, just specifically talking about how can we make you walk more steps?

Participant 022 20:26
Okay. And if the goal is simply, "How can I—how can you make me walk more steps?" I

think, being able to choose the times when I was like, um, prompted, because I think I could have adjusted just a little bit where it's like, I—you know, it could have been a time where I felt like I could either block off my calendar, or just, um, go and it would have, it's interesting that, like, there was such a social aspect to it. I think if I had been in a completely different experiment, like, if if you'd asked, like, "Who do you want to walk with? Who are you to walk with today?" um, that would have—and then I probably would have, you know, find, like, found someone to walk with me. Um, or, like, I mean, this is just getting into like, really complicated things. Um, let's see here.

Researcher 21:32
it's okay, go—like, let's like go crazy. No constraints. Like, okay—

Participant 022 21:36
Um if—because I generally feel really positive after walking. And so yeah, if like, if I was able to like, track how I felt as like, after I was done walking.

Researcher 21:48
Yeah.

Participant 022 21:49
I think it would have been like a reminder that like, "Oh, yeah, like even though I feel busy right now. I feel great—"

Researcher 21:55
Yeah

Participant 022 21:55
"—right after I take a walk."

Researcher 21:56
I love that.

Participant 022 21:57
So, I think sometimes I had a tendency, because it was just the prompt, just to walk.

Researcher 22:02
Yeah.

Participant 022 22:02
Um, I ended up feeling, like, disappointed—

Researcher 22:07
Yeah.

Participant 022 22:07
—that I couldn't do it.

Researcher 22:08
Right.

Participant 022 22:09
Uh, so if I would have, like, counteracted that with like a very positive feeling after I had walked—

Researcher 22:16
Yeah.

Participant 022 22:18
—that could have been more motivating. Um. And, let's see, what else. Um. I mean, I was just so excited that I remembered to put it on that I wanted like points for remembering to put it on. Even if I couldn't walk

Researcher 22:46
Right, right. Like twenty steps right out the gate.

Participant 022 22:54
Um, no. I mean, yeah. I those are just the things that come to mind first.

Researcher 23:01
Cool.

Participant 022 23:01
Um, but yeah, if I would have found like a walking buddy, I bet I would take more steps. Um, even if that was—yeah, and some way to—I usually don't really care about, like, tracking, like, if I've actually completed things, but I'm very aware of like, my emotions throughout the day so it would have been fun to like, you know, track an emoji for how it made me feel or something.

Researcher 23:23
I love it. Yeah, that's awesome. Why do you think a walking buddy would have made you walk more steps?

Participant 022 23:30
Um. Two things. Just, number one, it would help me stay accountable because someone else is—like, you know, I've committed to someone else. And then number two, I—if, especially if it's at work, I feel like I could still, like—there's part of me that would feel productive still, because I could pick their brain, or like we could solve a problem together, or we could just, you know, build a relationship that would be good for both of

us. So there's some aspects of it that would still feel like [name redacted] is not just being a loner. She's probably still working.

Researcher 24:09
Gotcha. That makes sense. Okay, so you talked about—the first thing you mentioned was timing of the messages. What times would have been better for you? Or would that have changed on a daily or weekly basis?

Participant 022 24:24
Um. So, I think, uh—it's interesting, but I think right after lunch would have been, would be great. Um just because everybody, um—I tend, and maybe this is a human thing, but I tend to be, um, I notice what other people are doing, and so if I'm, you know, doing

something different than everyone else, it feels a little bit harder to go against the grain. But at lunchtime everyone's like, people are leaving, they're, you know, up and about. No one's expected to do anything. So if it was like 12:30, I mean, I could kind of do anything. And I feel at like, right after lunch would be great time to take a walk. So I think that time would work well. And also, if I could shift it a little earlier in the morning, so I usually, at sometime around 10 o'clock, um, I think—I,um, think I would have shifted a little bit, so kind of ended my, like, deep work time, and it would be like a break or transition into, like, when my meetings start.

Researcher 25:34
Gotcha. And that would have been—you would have kept those times, though? Like had a consistent schedule throughout the experience?

Participant 022 25:43
Yeah. I think so.

Researcher 25:45
And when you say after lunch, like, if your—is your lunch hour, like, 12 to one? You would have done it like, right at one, or like 1:15? What do you think? Like—

Participant 022 25:52
I think probably just 12:30.

Researcher 25:53
12:30? Right in the middle?

Participant 022 25:56
Yeah. So basically like shifting—instead of like, socializing while I eat, I probably would have eaten a little more quickly, or just taken food with me. And just like use more, like the lunchtime, probably to walk.

Researcher 26:11
Yeah. That's funny. That's—my original experiment design had that, and then my professor was like, "Oh, well you should do two per day. So like, one in the morning, one in the afternoon." Which actually leads me to my next question, so, how about frequency? Was two messages good? Would you have liked one, like, before work or one after work? Like, how many and was the fact that it was during work better or worse? And would you have liked to be able to set that yourself?

Participant 022 26:41
Yeah, I mean, I honestly think about my schedule on a weekly basis—

Researcher 26:47
Yeah.

Participant 022 26:47
—just because, um, I was doing, like, I was, I traveled a few times during it. Um, and so I tend to look out, like, plan out my week and say, like, "What am I doing this week? Am I in San Francisco? Am I, you know, what—am I doing an event, am I in Utah?" Um, and so I think if I—I love it actually, staying consistent in, you know, throughout the day or—but if I could say, you know, "I'm going to be in California this week, my lunch hour is going to be one hour earlier, um, or later. Am I'm going to be in Boston, um, I'm actually going to black out that day—"

Researcher 27:29
Yeah.

Participant 022 27:30
"—but I think I could take the mornings and walk, because my events are in the afternoon." So I'd probably try to keep it consistent for a week, for, you know, for like a week at a time, but be able to shift it based on my particular situation.

Researcher 27:46
Gotcha. So were the—

Participant 022 27:47
I love the feeling of the routine, but—

Researcher 27:49
Right.

Participant 022 27:49
Yeah.

Researcher 27:50
But like, so were you in a different time zone for the experiment at any time?

Participant 022 27:57
Yeah.

Researcher 27:58
And then, and what happened then?

Participant 022 28:01
I can't remember. [Laughs]

Researcher 28:04
[Laughs] The funny thing—

Participant 022 28:04
Did it shift?

Researcher 28:05
No [laughs] no, it was always Mountain Time, I didn't like, think about that at all. All the texts went out Mountain Time, so if [name redacted] had taken it to Australia he would have been getting a text at like three in the morning or whatever.

Participant 022 28:22
[Laughs]

Researcher 28:23
Yeah. Um. Okay, so—and then, but, did you say if the frequency was okay? Two messages a day felt good?

Participant 022 28:36
Um. I think it was—it was okay. Yeah, I—once I get into a habit I don't really need the messages—

Researcher 28:45
Yeah.

Participant 022 28:46
—as much. So there were certain times where I was like, "I know I'm not gonna, like, walk this afternoon—"

Researcher 28:55
Yeah.

Participant 022 28:56
"—I know I'm going to get a text and I'm not going to be able to walk. And the text is going to be cute, and remind me how good it is, and I'm just gonna be a grouch and, like, ignore it." [Laughs] So if I knew I couldn't do it, like, there was a little bit of impending doom, knowing it was coming. [Laughs] Slight impending doom.

Researcher 29:29
Okay, so the—so maybe for you it would have been better just to have one in the morning, none in the afternoon? Or one during lunch and one in the morning? Is that what you're saying?

Participant 022 29:40
Yeah, one in the morning—one in the morning and one at lunch would be perfect.

Researcher 29:44
Cool.

Participant 022 29:44
Yeah.

Researcher 29:45
And then what about, like, would you have liked to get a reminder after work? Or is it better just to keep this like a work thing?

Participant 022 29:53
I would have liked to get a, you know—I'd love to, I would like to get a reminder, or a recap or something on Sunday—

Researcher 30:03
Okay, cool.

Participant 022 30:05
—that's just like—

Researcher 30:06
Here's how you—

Participant 022 30:08
—like, "Who's, you know, like—who's your walk buddy this week?"

Researcher 30:13
Oh, yeah.

Participant 022 30:14
And like, "Do you need a shift? Do you need to adjust the times?"

Researcher 30:17
Yeah. Okay.

Participant 022 30:18
Um, and then, you know, maybe if I had, like, set any specific goals for myself, or like, being able to visualize what I walked in one. But yeah, I think two texts is actually fine, but they need to be at times where it's reinforcing what I can do and not what I can't do. [Laughs]

Researcher 30:40
[Laughs] Right. That totally makes sense. Um. You touched on tone a little bit. What did you think of the tone of the messages?

Participant 022 30:50
Oh, they were like, friendly and happy and, what's the word I'm searching for?

Researcher 31:05
Like—

Participant 022 31:05
Um, supportive.

Researcher 31:10
Yeah?

Participant 022 31:13
They definitely were, I mean, yeah. They didn't, like, shame me. [Laughs]

Researcher 31:21
[Laughs] So overall happy with the tone of the messages?

Participant 022 31:28
Yeah.

Researcher 31:29
Okay, cool. It's funny because one of the interview people said that they're in Duolingo, they use Duolingo. And they said that like, if you go for a long time without using the app, the messages start to get angry. [Laughs] Like way more aggressive.

Participant 022 31:49
I was actually wondering the first day, I was like, "Are these gonna be the same every day?"

Researcher 31:53
Right.

Participant 022 31:54
Um, but was happy you, like—there seemed to be enough, like, um, difference that they still felt like fresh every day.

Researcher 32:04
Okay, good, good. I took—yeah.

Participant 022 32:08
I don't know how many you ended up writing.

Researcher 32:10
Like, uh, so it's five days a week for six weeks, and I reused each of them one time, so.

Participant 022 32:18
Okay, yeah, I didn't notice.

Researcher 32:20
Okay. Cool. Um. What about, um, uh, format? So they were text messages. Talk about the format. Was that appropriate for you, or would you have liked something else?

Participant 022 32:35
Um, I—you know, it—I don't know if Fitbit, some of the Fitbits probably do have messages on them. But it could have been nice having, just, connected to the device itself.

Researcher 32:51
Yeah.

Participant 022 32:52
Um. It—for me it was fine because I had my phone on me all the time.

Researcher 32:56
Okay.

Participant 022 32:57
So, yeah. I—and I get a lot of texts, so that's, like, feels like a good communication method for me.

Researcher 33:06
Okay, cool. So you don't have periods where your phones on silent and you miss stuff, during the work day?

Participant 022 33:13
It's on silent, but I always see it, and I also have Messages usually up on my computer. So.

Researcher 33:19
Okay, cool. That makes sense.

Participant 022 33:21
Yeah.

Researcher 33:21
Um. Yeah. I was thinking about for the next round maybe doing it with like Slack,

because for the Android users, they don't have Messages on their computer, you know what I mean?

Participant 022 33:31
Oh, yeah.

Researcher 33:32
Um, would that, would of worked? Would that have worked for you? Or would that have been worse?

Participant 022 33:38
I mean, for me, it was actually nice that it felt slightly disconnected from work. So I think, um, yeah, in whatever way it, it was, I guess. Yeah. I would have preferred it maybe with the actual device itself, or my phone. I'm glad that it didn't get, like, lost in my work madness—

Researcher 34:01
Gotcha.

Participant 022 34:02
—in like, the communications of work.

Researcher 34:03
It could break through a little bit, because—

Participant 022 34:04
Yeah.

Researcher 34:05
—of the format. Gotcha.

Participant 022 34:06
Yeah.

Researcher 34:07
Makes sense. Um, and then you talked a little bit about how being, like, the only person who was, like, going off to walk maybe had a dampening effect, as opposed to, like, taking it during lunch when everyone was walking. Can you talk a little bit about that dampening effect?

Participant 022 34:30
Um, yeah. I think, um, [laughs] like this is me talking about my psychology. Um, I think I'm pretty aware—like, I like to be perceived as being productive, [Laughs] and if I'm inside the office, just walking around by myself, people may wonder what I'm up to. So, I

know that's probably silly and I could let go of that, but, um yeah, I just think it may look like I'm wandering around, instead of, like, working. [Laughs]

Researcher 35:21
Gotcha.

Participant 022 35:22
That's all.

Researcher 35:22
[Laughs] Well that's great. I do love the idea of somebody, like "What the [expletive redacted] is she doing just walking around?" Um. That's pretty much all I've got.

Participant 022 35:39
Okay.

Researcher 35:40
Is there anything else you want to share with me about your experience or, or anything?

Participant 022 35:47
Um, no, I was glad to be part of it.

Researcher 35:52
Awesome.

Participant 022 35:53
It was fun!

Researcher 35:53
Thank you so much for doing it. And thank you so much for doing this interview too. I

will graduate at some point, I promise.

Participant 022 36:03
Yay!

Researcher 36:03
It's looking really good for this semester. But yeah, seriously, thank you so much! And also we miss you so much. Are you guys gonna come visit soon? Here I'll stop the recording.

CASE #27 (LONE PARTICIPANT) INTERVIEW TRANSCRIPT

Researcher 0:04
So let's start with you telling me just what was your experience like?

Participant 027 0:23
Um, honestly pretty neutral. It was interesting having the Fitbit on and getting the texts, but I don't know that it really had much of an impact on me.

Researcher 0:35
Why or—why do you think that was? Why didn't it have an impact on you?

Participant 027 0:40
Um, my guess is probably there wasn't really any reinforcement. It was like, all right, you're gonna get a text, or I got a text, you know, what, twice a day or so?

Researcher 0:50
Mmhm.

Participant 027 0:54
But because it happens, you know, during work hours, you know, it's kind of something that I could just look at and then ignore.

Researcher 1:01
Gotcha. So you think that maybe if it had been at like a different time it would have affected you? Or was it something—

Participant 027 1:08
I think that's possible. If it had been in at, you know, like 6pm or something, once I was home, you know, and paying more attention to my phone, I think that might have made a difference.

Researcher 1:18
Gotcha. That makes sense. Yeah, we toyed with the idea of having, like, people be able to select their own times, right?

Participant 027 1:27
Mmhm.

Researcher 1:27
So it was like more of a catered experience, but...

Participant 027 1:30
So like, that would have skewed results, though.

Researcher 1:33
Yeah, I wanted it to be sort of like really narrowly targeted about like what we were studying. So...

Participant 027 1:40
Yeah.

Researcher 1:40
...it would have been nice. Anything else? Like, what like, uh, how about the, like, the tone of the messages or the frequency of the messages or the fact that was on weekdays, was there anything else about the experience that you feel like was—made it successful or not successful?

Participant 027 1:57
I mean, the tone of the messages was like, friendly and cheerful and encouraging. Um, I'm trying to think.

Researcher 2:06
And did you feel like that was positive? That kind of worked for you? Or?

Participant 027 2:10
You know, I'm not sure, honestly. Because, so I do Duolingo also. And it gets a little aggressive when I don't do something.

Researcher 2:21
Funny.

Participant 027 2:21
And that actually seems to help a bit. It'll start popping up more frequently and being like, do this or else you're losing points or whatever.

Researcher 2:32
So maybe angrier messaging? [Laughs]

Participant 027 2:34
[Laughs] It could be, yeah.

Researcher 2:36
That's funny. Um, did it ever make you walk?

Participant 027 2:44
Um, I think there were a couple times where, you know, I got the text and I was like, all right, I will at least like go outside and walk around the building and then go in.

Researcher 2:53
Ok.

Participant 027 2:54
So a few times, but I don't think it was it was enough to, um, to you know, make me fit or anything. [Laughs]

Researcher 3:03
Um, can you walk me through what your typical experience getting a text message was like?

Participant 027 3:10
Like how I reacted, or how I felt or...?

Researcher 3:12
Maybe just like, set the stage, like where were you, what were you doing, and then what sort of—like walk me through you getting the text and how you reacted to that. And like if it changed, like, just sort of a typical, like, on any given day what that would have looked like start to finish.

Participant 027 3:27
Yeah, okay. Um, so I think most the time of the texts came sometime between like 930 and 11:30am. And then there, I think there was one later in the day?

Researcher 3:36
Yeah, so 11:30am and like 2pm or 2:30pm.

Participant 027 3:42
Okay, yeah, that sounds about right. Um, so at those times, you know, it's, I'm usually at my desk, or in a meeting, so most the time I would get the text and sometimes I wouldn't notice because I keep my phone on silent at work.

Researcher 3:56
Gotcha.

Participant 027 3:58
Or at least I keep my phone on silent during meetings. Um, so sometimes I wouldn't notice. When I did most of the time, I would usually look at it and think, "Yeah, that's a thing I should do," and then I would put it, [laughs] put it back down for a while. Um, I think the ones in the morning that were close to lunchtime, maybe were a little more effective, because that's at a time when I can actually like get up and go out if I need to.

Researcher 4:26
Sorry, Google just randomly decided to chime in right then, can you say that one more time?

Participant 027 4:31
Oh, yeah. So the ones that came in around 11:30 I think, um, I usually happened to notice those more at least and sometimes they did prompt me at least getting up. Um, the ones in the afternoon we're usually in the middle of meetings or you know, I had just gotten back from lunch or something like that.

Researcher 4:47
I see. And did the, um, did that change over time at all? Like did the, I mean did your reaction to the messages change over time at all? Like, were you more motivated initially? Or...?

Participant 027 5:03
I think if anything, I got desensitized to them and started ignoring them probably.

Researcher 5:09
That makes sense.

Participant 027 5:11
In the same way you do with, you know, annoying notifications that you can't turn off from your bank or whatever. You just start ignoring them.

Researcher 5:23
So you mentioned that, like, there was a couple times where you felt like it actually did make you go on a walk. Right?

Participant 027 5:31
Yeah.

Researcher 5:31
But overall, it just really didn't influence how much you walked on a daily basis?

Participant 027 5:37
I think so. Yeah, I don't think it had a big impact.

Researcher 5:41
Gotcha. And did you have any social support like family or peers or others that helped encourage you?

Participant 027 5:50
No. I mean, so the first day that I showed up at work with a Fitbit on my team was like, "Hey, you got a Fitbit!" and I was like, "Yeah, I guess so," and that was that kind of it. [Laughs] So I didn't really go into it with anybody no. And the rest of engineering is pretty um...not active. [Laughs]

Researcher 6:16
Um, what did you enjoy most about your experience?

Participant 027 6:21
It was interesting to just know that my, the amount that I'm moving was being tracked. So actually, when I went back in at the end of it and like went and looked at how much I actually walk on a given day, just while I'm commuting, and I thought that was that was pretty interesting to know.

Researcher 6:44
And what frustrated you most about your experience?

Participant 027 6:49
Um, probably not being able, this is just related to how the study was set up, but not being able to go in and customize notifications and really play around with it.

Researcher 6:58
Yeah, totally. What would you have like to customize?

Participant 027 7:02
Maybe notifications, and maybe trying the sleep tracker.

Researcher 7:06
Oh, gotcha. Okay, I see. So just like not being able to play with the Fitbit app?

Participant 027 7:11
Yeah, yeah.

Researcher 7:12
Ok gotcha, that make sense. Yeah, I felt bad. Like, I was like giving people a Fitbit and then telling them not to use it.

Participant 027 7:19
Right, yeah [laughs].

Researcher 7:22
What do you think we could change or improve to make the intervention more effective at increasing the amount you walked each day?

Participant 027 7:30
Um, I think something like, um, so I don't know if Fitbit or any of the other things like that are aware of like, all right, you haven't done this today. But something like that, where there's sort of goalposts, like you need to hit this many steps per day, and it'll remind you if you don't, that kind of thing.

Researcher 7:49
Gotcha. So have like a specific goal in mind. And then, at a certain point in the day, if you're, if you haven't gotten that many steps or whatever the goal is, then it pings.

Participant 027 8:00
Yeah, yeah.

Researcher 8:02
Is there anything else that would have made you walk more?

Participant 027 8:12
Me personally? Me? No, probably not. Maybe someone who was more into fitness or just being healthy in general? Yeah.

Researcher 8:22
Well, maybe just like a change in motivation would have been important.

Participant 027 8:26
Yeah, yeah.

Researcher 8:30
And is there anything else that you want to tell me about your experience?

Participant 027 8:38
No, nothing I can think of.

Researcher 8:40
Cool. Okay, well, that's actually, that's it. Um.

Participant 027 8:44
Okay.

Researcher 8:46
Yeah, I'm trying to think if there's anything else we should cover while I've got you.

Participant 027 8:50
So, did I actually, was there an effect on my movement from the notifications that you could tell?

Researcher 8:57
I'm not sure. We could, I wonder if we could pull it up? Um, because I only did statistical analysis on the two groups, right? So I don't know—

Participant 027 8:59
Oh right, okay.

Researcher 9:03
—about individuals but—

Participant 027 9:09
Okay.

Researcher 9:10
—you could probably even—here's the crazy thing about statistics is you could even pull it up and like plot out your walking, and still not know without like running a stats test whether there was actually a statistically significant difference in your behavior.

Participant 027 9:26
Right, right.

Researcher 9:27
But I don't know how many times do you think you like, actually walked because of it, like total?

Participant 027 9:34
Because of it? I would say like maybe three or four.

Researcher 9:38
Yeah.

Participant 027 9:39
But I'm wondering if maybe it had some other, you know, vague impact where it wasn't directly, at least in my mind it wasn't directly because of the notification, but I was still getting up and moving more or something like that.

Researcher 9:49
Yeah, maybe like subconsciously affected you or something?

Participant 027 9:52
Yeah.

Researcher 9:53
I wonder. It would be interesting to find out—I was curious to find out, like, who the most changed, and least changed people were in the study, you know, I mean?

Participant 027 10:02
Yeah but—yeah.

Researcher 10:06
But yeah, I wonder—so, like, customization of notifications seems like important, right? Being able to say like, "Okay, look, I have daily stand up at 11 every day, don't send me a text right then."

Participant 027 10:17
Right.

Researcher 10:17
Like that would be essential, right?

Participant 027 10:19
Yep.

Researcher 10:20
And then I guess theoretically being able to adjust the tone would be maybe helpful. And then frequency, like, how many times per day do you want to actually get up and walk? Um.

Participant 027 10:33
Yep.

Researcher 10:34
Is that it?

Participant 027 10:35
And I think really having specific goals to me, like, "You said, you were gonna do 10,000 steps," so it's gonna yell at you if you don't do 10,000 steps or something like that.

Researcher 10:44
Right. I really wanted to have something as well where like, once the person started walking, you've got some kind of little reward, you know, like,

Participant 027 10:53
[Laughs]

Researcher 10:53
[Laughs] I mean, not like, not like a treat or something, but like—

Participant 027 10:57
Right [laughs].

Researcher 10:58
But some sort of like, um—

Participant 027 11:00
It calls up Grubhub and has them ship you a burger or something [laughs]

Researcher 11:04
Or earning like Subway rewards.

Participant 027 11:07
Yeah [laughs]

Researcher 11:08
[Laughs] That would be pretty great. But no, just like, I don't know if it would be like, experience points or just like a vibration that was like "Ding! You're like—good job. You're like walking." You know—

Participant 027 11:19
Right.

Researcher 11:19
—something. Just to tell you that like, you did a good job. I don't know. But yeah, goal seems like a pretty good idea. And do you think having like a group of people on the office participating in the same program would have made you walk more?

Participant 027 11:38
My guess is yes, yeah. If there was, you know, peer pressure.

Researcher 11:43
Yeah. But there could be a dampening effect too, you know what I mean? If the ball doesn't get rolling for anybody, then you feel like the weirdo who's getting up to walk by yourself.

Participant 027 11:52
Yeah, that's true.

Researcher 11:54
But yeah, it seems to have a positive effect. There was statistical significance for that. So, I don’t know. Anyway, yeah, I guess that's it, [participant name redacted]. Thank you so much.

Participant 027 12:06
Cool. Yeah, no problem.

Researcher 12:08
Cool, dude. I guess I'll talk to you later.

Participant 027 12:10
Yeah. See you.

Researcher 12:11
Okay.

Participant 027 12:11
Have fun in New York!

Researcher 12:13
Yeah, yeah. Hey, come visit anytime man.

Participant 027 12:16
Alright.

Researcher 12:17
Alright, see you [participant name redacted].

Participant 027 12:18
See you.

CASE #28 (LONE PARTICIPANT) INTERVIEW TRANSCRIPT

Researcher 0:31
K, I'm just pulling up my notes now. Um, so basically, I'm asking a series of questions that are just, uh, about figuring out what worked for you, what didn't work for you, and what we can make better in the future. Because this is like the first iteration of the experiment, right? So if there's stuff we can improve that would have made you walk more then I want to know about it. Um, so let's start with you just telling me what your overall experience was like.

Participant 028 1:09
Uh, it was good. [Laughs] No, just kidding, no, it was it was—I tried to stick to the regimen and, uh, or as much as possible and it was pretty easy to wear and, uh, it was kind of weird not knowing, I didn't check my steps, so it's kind of weird not knowing the data, you know, like not weird but kind of, uh, hard to not check [laughs]—

Researcher 1:09
Mhmm yeah.

Participant 028 1:20
—how many steps you actually took.

Researcher 1:45
Right.

Participant 028 1:47
Um, other than that, yeah it was pretty easy. Um, those Fitbits are nice because they maintain a charge for a long time too so I wasn't charging it so much, you know.

Researcher 1:58
Nice.

Participant 028 1:58
Like, it was a pleasant experience, it wasn't bad.

Researcher 2:03
Awesome. What was your typical experience like getting a text?

Participant 028 2:10
Um, I would read the text. Usually I was busy so I wouldn't do it right then. But I would be like, oh yeah, I have to do that. And that was about it.

Researcher 2:20
Okay, so you were typically, like, busy at work, what in meetings or just trying to get

work done or what?

Participant 028 2:30
Yeah, being in meetings and, uh, trying to get my work done.

Researcher 2:35
Okay, and would it, if you got the text and saw, would that affect your behavior at all? Like, would you walk later on or would you just, like, uh, if you didn't have time to walk then was like, okay, I'm gonna try and catch the next one.

Participant 028 2:48
Umm yeah I think—I don't know if it necessarily would change my behavior but it would make me think about it—

Researcher 2:51
K

Participant 028 2:57
—more than I would have. Ya know, if that makes sense. Like I maybe like would have some guilt or something [laughs] like knowing that I like should be doing that but wouldn't maybe necessarily change my behavior.

Researcher 3:11
Totally. So do you think it impacted your like walking at all?

Participant 028 3:24
Yeah, I think yeah maybe a little, maybe a little bit just knowing like, oh, I should be doing that. But I don't think, uh, drastically, maybe like a few times on days where I was like, oh yeah, I want to do that.

Researcher 3:38
Cool. But safe to say for the most part that you were unable to walk when you got the text messages?

Participant 028 3:46
Yeah, had to work or something.

Researcher 3:50
Oh sorry, you got really quiet right then, can you say that again?

Participant 028 3:54
So usually I was in the middle of something [inaudible] I might do it later on, but like I was wondering when I'm gonna go do that or you know it's like, I've got a chore to do or something like that, like I need to do it but um something came up. It was like in the back of my mind—

Researcher 4:10
I don't know why, you just got way softer.

Participant 028 4:12
Oh sorry, can you hear me?

Researcher 4:14
That's better, cool.

Participant 028 4:16
It mainly was like a feeling in the back of my mind that I had to do it, you know?

Researcher 4:21
Gotcha. And did that change over time? Like, was there a difference from the beginning of the study towards the end of the study?

Participant 028 4:29
Yeah, I think as time progressed then it became less and less, uh, in the forefront of my mind.

Researcher 4:37
Gotcha. That makes sense. So overall, um, if you had to estimate like how many times during the study you think that your number of steps per day was influenced, could you ballpark that?

Participant 028 4:54
So it was a month, right? How long was the study?

Researcher 4:56
Yes, there was like two weeks of just baseline establishment where we just had you wearing the Fitbit but didn't get any texts, and then like four weeks of getting texts.

Participant 028 5:05
I would say—

Researcher 5:07
And it's totally fine, by the way, it's totally fine if it didn't impact your behavior at all. Like—

Participant 028 5:10
—yeah, yeah, yeah.

Researcher 5:11
—I just want to know what it was like for you.

Participant 028 5:13
I'm not trying to be biased at all—

I'm just being honest so—

Researcher 5:14
Cool.

Perfect.

Participant 028 5:17
—um, probably maybe three or four days, five maybe, the whole time.

Researcher 5:21
Cool. What was the difference on those days?

Participant 028 5:29
Um, I don't know, it could have been that I was more in the mode of maybe wanting to get more steps in. Or, you know, "oh yeah I'm not" or I wasn't as busy those days and you know, or I decided, I got the text and maybe I decided to walk to lunch or something close by, you know, just to uh, something like that, because that happened. So I get the text, and be like, "oh yeah, let's walk down to Smith's or something and get something instead of going in my car," whatever.

Researcher 5:57
Nice. Did you have any social support like family or peers or coworkers that helped encourage you?

Participant 028 6:05
Uh, no coworkers. Uh, family, yeah. But that was about it.

Researcher 6:11
Cool. Tell me about that a little bit.

Participant 028 6:14
Um, well, [spouse's name redacted] knew that I was in the study so she knew that, uh, she would see that I would get the texts, sometimes if I left my phone or something, and then um she'd be like, "oh yeah, you should do that," just kind of moral support.

Researcher 6:28
Nice. And do you feel like that was helpful?

Participant 028 6:33
Uh, yeah.

Researcher 6:34
How so?

Participant 028 6:35
Uh, [laughs] maybe it's just, the underlying guilt [laughs] of needing to do it, you know.

Researcher 6:45
[laughs] Uh so, sort of like positive peer pressure?

Participant 028 6:50
Yeah.

Researcher 6:51
Gotcha. What about the situation of the office, what was it like to be getting the texts around people?

Participant 028 6:58
Um, it was fine. I don't, I mean, nobody really knew that I was getting texts so—

Researcher 7:05
Gotcha.

Participant 028 7:06
—it was ok.

Researcher 7:08
What did you enjoy most about the experience?

Participant 028 7:14
Um, enjoy? Probably getting the reminders that I should be more active, probably was the best part of it.

Researcher 7:22
What did you like about that?

Participant 028 7:22
Even if I didn't act on it, it's still good to be reminded to act, you know?

Researcher 7:30
Totally. What about, what was most frustrating about the experience?

Participant 028 7:36
Um, maybe feeling guilty for not being able to walk. [inaudible]

Researcher 7:43
I can barely hear that. Can you say that one more time?

Participant 028 7:45
Oh, feeling guilty, um when I wasn't able to walk and the text came in.

Researcher 7:50
Right, that makes sense. Um, what do you think we could improve or change to make the intervention more effective at increasing how much you walk each day?

Participant 028 8:07
Maybe like have a reward incentive or something where you like, some—Like you could make it competitive with your friends or coworkers or something where you had, I don't know, some incentive to do it beyond text message.

Researcher 8:21
Yeah. Anything else you can think of?

Participant 028 8:33
Um, no. [Laughs]

Researcher 8:36
What did you think about like the frequency was twice a day a good number of times?

Participant 028 8:44
It didn't bother me, twice a day didn't bother. Maybe three times a day would have been nice. Um, I can't remember if, like what the times were, if they were, after—

Researcher 8:53
It was like, I think it was like 11am and 2pm or 11:30am 2:30pm, something like that.

Participant 028 8:59
Yeah, so like around nighttime might be nice too.

Researcher 9:04
Cool.

Participant 028 9:04
You know when you get off work and you're at home.

Researcher 9:10
That makes sense. Why would that have been easier?

Participant 028 9:15
That, yeah that might of been. At times where I wasn't as busy then I could have, um, taken more steps.

Researcher 9:22
That makes sense. What about, um, the tone of the messages? Was that okay for you?

Participant 028 9:31
Yeah.

Yeah, they were encouraging—

Researcher 9:31
Okay. And, um—

Participant 028 9:38
—positive.

Researcher 9:38
—what about the, um, like the delivery format is text messages the best way to get notifications?

Participant 028 9:48
Yeah, I think text messages are probably the best, they're the most intimate, I would think, um, as far as something like that goes.

Researcher 9:57
More intimate than what?

Participant 028 9:59
Than like an app notification, or a phone call's not, I mean that's weird kind of [laughs], a text message is intimate enough to pay attention to, but not as the background as like an app notification.

Researcher 10:21
What about before work? Would that have been helpful or not really?

Participant 028 10:25
Probably not for my, um, lifestyle, just because I wake up and I get my son ready for school and everything, and then afterward, you know, then I go to work right after so I don't really have time in the morning. Um. But maybe for other people who get up really early and you know have like mornings free might get up and, um, get their steps in or whatever.

Researcher 10:49
For sure. What about being able to set, like, the time yourself? Like, would there have been a better time of day to receive it during the workday?

Participant 028 11:01
Yeah that might be a good idea, to be able to set it yourself because you know your own schedule.

Researcher 11:10
If you had like—

Participant 028 11:11
[mic feedback]

Researcher 11:12
Sorry, say that again?

Participant 028 11:14
And then you can know what your free time is, so that might be more effective.

Researcher 11:19
If you had the ability to like set your own, like to customize your own notification timing and frequency, what do you think you would have set for yourself?

Participant 028 11:30
Probably three times a day. One at 11, one at probably 3 o'clock, and one around 6:30.

Researcher 11:41
And then for the ones during the workday, I think you mentioned that you sometimes had like meetings right?

Participant 028 11:49
Right.

Researcher 11:50
Would it have been helpful if the messages like automatically looked for slots in your calendar that were available?

Participant 028 11:58
Yeah, that would be nice. So then you have a general time, and then if no one's done it'd say okay I should reply to them after the meeting, and then you're probably more incentivized to go for a walk, especially after a stressful meeting's done.

Researcher 12:18
For sure. Um. Talk a little bit about how you think having other people receiving texts in the office might have affected your behavior.

Participant 028 12:26
Um, well it depends on the people, but yeah, if they're—it would probably, if we were all in the same study, then yeah, I'd probably be more incentivized to get all the steps in.

Researcher 12:42
And why do you think that is?

Participant 028 12:45
Uh, probably just because you don't want to be the one that's not walking around if everybody's in the same study [laughs]. Peer pressure.

Researcher 13:01
Anything else?

Participant 028 13:02
Uh, no.

Researcher 13:07
Is there anything else you want to share about your experience or about ways that we could improve it?

Participant 028 13:14
Uh, yeah, no, I just think making it subject-based and maybe, yeah, doing a study in an environment with more than one person in the same company, um, could help incentivize people to walk more. So like, for large companies, I could see it working out, actually being more effective than in my environment where if I was the only one at a really small company, but in larger companies where it's incentivized and then, or, competitive or whatever it could be a lot more effective.

Researcher 13:27
Awesome. Is there any, like, people at your office specifically that it would have been good to be getting the texts with? Or that would have been like less, like that wouldn't have mattered as much? Like—

Participant 028 13:59
Oh yeah, definitely. I guess it depends on the people you talk to the most, right?

Researcher 14:04
Yeah. So like personal relationships or like who's on your team? Or is it kind of both? What do you think?

Participant 028 14:12
Probably both, and maybe even like supervisors and things like that, you know if you're held accountable for your steps or whatever, you know? Not accountable but like incentivized in like the supervisor's involvement.

Researcher 14:28
Like if your supervisor was involved, you'd be more likely to participate?

Participant 028 14:34
Yeah, probably.

Researcher 14:37
K, I think that's pretty much it. Oh, there was one more thing. So what about like you said charging wasn't really a problem for you? Was it ever a problem to have to charge the device or remember to wear it?

Participant 028 14:48
Um yeah there was a couple days where I forgot to where it. But overall I think that device is probably the best in the line for the study, because it just lasts the longest, right?

Researcher 14:58
Yeah.

Participant 028 14:58
So it's easier to get data. It's easier for me to charge it because I didn't have to do it as often. Um. And I think it works well and it's lightweight. I got used to it really quickly.

Researcher 15:17
Awesome. Okay. That's it!

Participant 028 15:20
[Laughs] All right.

Appendix G

Survey Responses

CASE #01 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

Discovered I don't like using a wearable but felt like I did walk more during the experiment.

Can you tell me about your typical experience getting a text message? Did that change over time?

I felt like it worked as a reminder. The notification noise became a reminder irrespective of the content of the text.

Tell me about how the text messages influenced how much you walked each day.

I felt like the monitoring itself was the biggest motivation. Text helped as a reminder though.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Nothing out of the ordinary. If having others in the office also doing the experiment helped it was only at a subconscious level.

What did you enjoy the most about your experience?

Trying out a wearable was something I wanted to try even if I didn't like it in the end. Always enjoy finding experimenting with ways to stay healthy. Happy to help science.

What frustrated you the most about your experience?

The wearable fell off too easily and was obtrusive in some tasks. Sometimes too easy to forget to wear.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

A less obtrusive wearable. For me personally a competition and feedback would increase my distance but that may not apply to everyone.

Is there anything else you want to tell me about your experience?

Nope. Good work!

CASE #03 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

I find it easy to just put on the tracker every day.

Can you tell me about your typical experience getting a text message? Did that change over time?

I got used to getting the message and taking action, but rarely remembered to stand up in my own

Tell me about how the text messages influenced how much you walked each day.

Very much

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

I like walking on a nice day and this encouraged me to do so

What frustrated you the most about your experience?

The tracker wasn't very comfortable

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Nothing, I like getting messages

Is there anything else you want to tell me about your experience?

CASE #04 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

The texts were about as helpful as a push notification. It was easy to ignore and miss the walk during the day

Can you tell me about your typical experience getting a text message? Did that change over time?

Typically I'd just mark the message as read and forget about it. The first couple of days I would go on at least one walk but after a week it was easy to ignore the message

Tell me about how the text messages influenced how much you walked each day.

Not very much. It was easy to ignore the message and not do the walk

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Not really. I am good about keeping active on my own time before or after work so I don't seek out any activity during the day

What did you enjoy the most about your experience?

I liked having the fit bit to keep track of my workouts and it did encourage me to take the stairs every day

What frustrated you the most about your experience?

Sometimes the texts were annoying because I knew I was just going to ignore them

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Maybe if the notification came with an accountable buddy system rather than a passive one. Like you get some kind of reward for other people's progress which would encourage both of you to reach out to each other and walk or exercise together

Is there anything else you want to tell me about your experience?

It was fun and I learned that the tracking helps before and after work but not so much during the day

CASE #05 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

I felt like wearing thw fitbit and knowing my steps were being monitored affected my behavior.

Can you tell me about your typical experience getting a text message? Did that change over time?

The messagws didnt seem to affect me because I was always busy at the time the tezts went out, it may have been more usedul to receive them in the evening

Tell me about how the text messages influenced how much you walked each day.

I dont think they did

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

It was interesting to see that my steps were ao much less when I woekwd from home. It made me concious of how much collaboration in the office drove movement.

What frustrated you the most about your experience?

Forgetting the fitbit in the morning.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Make the texts occur outside of working hours.

Is there anything else you want to tell me about your experience?

CASE #08 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

It was nice having co-workers close by that also got the texts. Usually we'd go on our walks together.

Can you tell me about your typical experience getting a text message? Did that change over time?

At first the text were working, as soon as I got the text I'd turn to my coworker to see if they wanted to go on a walk and we usually did. As time went on my work task usually took priority as I didn't find the text as impactful.

Tell me about how the text messages influenced how much you walked each day.

Before this task I've never actually gone on walks at work. But I found the texts helped push me to go on walks and also served as a good reminder.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Yes, coworkers. As stated earlier, we'd usually turn to each other to see who wanted to go on a walk

What did you enjoy the most about your experience?

Going on walks with co workers and having good conversations

What frustrated you the most about your experience?

Charging the Fitbit

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Add shia labeouf motivational memes. Or have text reminders that get triggered if Fitbit doesn't recognize that You are moving.

Is there anything else you want to tell me about your experience?

Fun study to be a part of. It be cool If companies started implementing walk sessions where they invite co workers to go on a 20 minute walk each day during work.

CASE #12 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

Good to get reminders on being healthy

Can you tell me about your typical experience getting a text message? Did that change over time?

I think it helped me realize I needed to do more but not having the time at the moment

Tell me about how the text messages influenced how much you walked each day.

It was more of a reminder but would soon be trumped by the day to day business work

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No one really talked or helped me push to be more active

What did you enjoy the most about your experience?

What frustrated you the most about your experience?

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Is there anything else you want to tell me about your experience?

CASE #15 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

It was good. It was really hard to be motivated to go out and walk during the time periods especially when it got really cold. Other then that it was fun!

Can you tell me about your typical experience getting a text message? Did that change over time?

It was a solid reminder to walk. It was hard receiving it at the same time every day cause if I had a meeting or something I wouldn't be able to walk at that time. I wouldn't say that changed over time.

Tell me about how the text messages influenced how much you walked each day.

It certainly kept my mind on walking and made me walk more then I would of

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

I did not

What did you enjoy the most about your experience?

It was good for me to get out. I would say walking definitely had a positive effect on my day every time so that was good to see and learn.

What frustrated you the most about your experience?

Sometimes I just really did not want to walk. Also the Fitbit not syncing automatically was kind of frustrating.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Allow the user to choose the time they get messages.

Is there anything else you want to tell me about your experience?

No, thank you for the experience though.

CASE #16 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

Generally good. However, I was rarely convinced to go for a walk sadly.

Can you tell me about your typical experience getting a text message? Did that change over time?

I intended to go for walks when I got the texts but often ended up being too busy doing other things to make time for them.

Tell me about how the text messages influenced how much you walked each day.

I probably walked more because the texts made me think of walking at other times than when I received the messages.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

I saw people in the office going for walks when they got the text messages which did keep the idea of going for a walk fresh in my mind.

What did you enjoy the most about your experience?

Best was definitely having going for walks more frequently at the top of my mind.

What frustrated you the most about your experience?

A few times when I was really busy, the texts were distracting and annoying but I don't think it was the fault of the experience.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

If I was able to set a schedule of reminders or have time ranges within which reminders would be sent then it might help. One issue I experienced was that I was often very busy at the two times of day I would receive the texts.

Is there anything else you want to tell me about your experience?

No, thanks for letting me be a part of the project!

CASE #29 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

Generally good. I think the texts encouraged me to get out and move more.

Can you tell me about your typical experience getting a text message? Did that change over time?

Usually it just put a walk into my mental " to do" list. Occasionally when I was busy it was mildly annoying.

Tell me about how the text messages influenced how much you walked each day.

I know I took some walks that I wouldn't have without the reminders. I can't really judge how it affected my total exercise.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Yes, my peers at work were walking more because of the messages, and sometimes I went with them.

What did you enjoy the most about your experience?

The social experience of walking with peers.

What frustrated you the most about your experience?

Occasionally the texts were an interupttion.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Give me more control over when and how often I receive reminders.

Is there anything else you want to tell me about your experience?

It's a good, simple idea.

CASE #31 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

It was interesting, it made me think about how a fitness app might use reminders to encourage you to get up and take a walk. The friendliness of the messages was more of a helpful guide to make me think I should get out and move. I think if there were set goals (hit x steps per y period), that would have made the text messages a bit more effective ("You have only 10 more to go!").

Can you tell me about your typical experience getting a text message? Did that change over time?

Depending on the day, the high frequency of text messages compared to how busy I was would encourage me to dismiss and ignore them. If they came in when I wasn't too busy, I would read them and consider taking a walk.

Tell me about how the text messages influenced how much you walked each day.

Depending on how busy I was, it would generally make me think I should go take a walk, but it wasn't something I necessarily acted up (perhaps, only twice).

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

The interaction with coworkers that were also involved :)

What frustrated you the most about your experience?

The texts during particularly busy times. Without a way to set an ignore on them, they became a distraction more than an encourager.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Having goals and targets.

Is there anything else you want to tell me about your experience?

CASE #33 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

I started this project right around the time I was wanting to spend more time focused on increasing my activity level and monitoring my food intake. It was a really good kick start to what I wanted to be focused on

Can you tell me about your typical experience getting a text message? Did that change over time?

I specifically found that text messages were somewhat of a reminder, but realistically were more ignored as the project went on, even though I wanted to not ignore them.

Tell me about how the text messages influenced how much you walked each day.

It was more of a guilt inducer that I should have been walking by the end. At the beginning it had some more effect.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

I just noticed that some of my co workers were still on the plan, and that encouraged me to remember I was doing it as well. And when other co-workers ignored it, I tended to ignore it too.

What did you enjoy the most about your experience?

Getting a Fitbit, I've been meaning to pick one up for a while :)

What frustrated you the most about your experience?

Getting used to the phone app.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

If there was a company requested/mandated time to all go on a walk as a company, I could see that making a difference.

Is there anything else you want to tell me about your experience?

It was overall good! Thanks for inviting me to do it!

CASE #34 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

It was an unobtrusive way to remind me to stand up and walk. I wear another fitness tracker normally, so wearing both was more cumbersome than I originally thought, but it wasn't too bad. Because it wasn't my primary health tracker, I did forget to charge it a few times.

Can you tell me about your typical experience getting a text message? Did that change over time?

It came in with different messages which made it seem less like a standard reminder. It was never annoying

Tell me about how the text messages influenced how much you walked each day.

It rarely influenced me to get up and walk. It may have reminded me that I had been sitting for too long and I would stand and stretch.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Not really

What did you enjoy the most about your experience?

The varied text messages.

What frustrated you the most about your experience?

Wearing a separate health device to track it.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Maybe having feedback based on the amount walked vs just the reminder.

Is there anything else you want to tell me about your experience?

CASE #30 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

It was ok. For the most part I ended up ignoring the texts or being snarky with the reminders unless my coworkers asked me to join them. Peer pressure was a stronger factor than the reminders.

Can you tell me about your typical experience getting a text message? Did that change over time?

It felt like the texts I get for other reminders like sales or political action, which I'd mostly put to the side and forget. I only followed it if my colleagues told me they were going walking. It only changed over time as my colleagues became more insistent on walking.

Tell me about how the text messages influenced how much you walked each day.

The texts did not pressure me or influence me unless someone else said something.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

My colleagues are the only ones that would mention it. It was fun to walk with them. I felt slightly dumb and awkward doing it by myself.

What did you enjoy the most about your experience?

Getting to chat with my colleagues as we walked together.

What frustrated you the most about your experience?

Nothing really. Maybe a sad realization of how much I am influenced by peer pressure over my own resolvd to maintain a happy lifestyle.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Involve a competitive or group element like the Fitbit challenges. Otherwise I will sit on my chair until the cows come home.

Is there anything else you want to tell me about your experience?

N/A

CASE #30 (GROUP MEMBER) SURVEY RESPONSES

What was your experience like?

I was in the middle of a tight deadline and Was so focused on work that I ignored the text messages.

Can you tell me about your typical experience getting a text message? Did that change over time?

I have an Apple Watch so when I got the text I would just look at my wrist and at first I thought I should probably go on a walk but usually wouldn't. Over time I just ignored the texts.

Tell me about how the text messages influenced how much you walked each day.

At first I might've walked a little bit but over time it had no affect on weather I wanted to go walking or not

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No, I didn't really tell other people about it. I did have some co workers that would go on walks when they got the text but I was swamped with a deadline so I wouldn't join.

What did you enjoy the most about your experience?

Had I not been so busy I think it is a great idea to get up and move through out the day especially since I have a desk job.

What frustrated you the most about your experience?

That I was so busy that I felt like I didn't have time to go on more walks

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

I'm competitive, so make it more social or a competition.

Is there anything else you want to tell me about your experience?

Nope, I hope you get all of the data you need for your masters!

CASE #06 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Good. I found that when I received reminders it helped me get away from my desk more frequently. Although many times I wasn't able to because I was in the middle of work.

Can you tell me about your typical experience getting a text message? Did that change over time?

I enjoyed the experience. The texts were sometimes pretty funny and they came at different times so that helped with not interfering with my routine at the same time every day.

Tell me about how the text messages influenced how much you walked each day.

Most days it would help me get up and move more than before.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Yes, my partner and I try to live a healthy lifestyle that includes taking walks frequently.

What did you enjoy the most about your experience?

I enjoyed having access to the data with a device that isn't my phone.

What frustrated you the most about your experience?

I never really got frustrated with anything.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

More messages at different times throughout the day. Or the ability to be reminded again in 10 minutes.

Is there anything else you want to tell me about your experience?

Overall it was a good experience. Thanks.

CASE #09 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

I wondered if I'd remember to put on the Fitbit everyday, but it wasn't that bad since it charged by the side of my bed every night. The Fitbit band was really hard to attach so that was a pain, but that's Fitbit's problem.

Can you tell me about your typical experience getting a text message? Did that change over time?

It was as if I had set up a reminder to go off on a regular interval, so after a while I started ignoring it. I usually got the text while I was in the middle of work so I just dismissed it. The tone was nice and friendly so I appreciated that.

Tell me about how the text messages influenced how much you walked each day.

I think maybe two or three times towards the beginning of the study I stood up and walked around the office but that's it. I mostly just ignored the text messages.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Unfortunately no. In the past this has been the single element that has made the most difference in my fitness. When I had a group of guys depending on me to come and play ball, or a workout buddy at the gym, I was exponentially more consistent and my workouts were always better.

What did you enjoy the most about your experience?

Helping David with his masters thesis

What frustrated you the most about your experience?

Putting on that stupid band every morning.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

As a social accountability component. Technology is great for reminding, "intervening" as you called it, and great for gathering and reporting on data. But technology lacks a motivating force. That needs to come internally from a person, or externally from positive social pressure. Without that component, technology becomes a nuisance and ultimately does more harm than good because it's a constant reminder to a person that they lack the motivation to improve themselves.

Is there anything else you want to tell me about your experience?

Nope, well done David! :)

CASE #10 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Pretty good. I had a hard time remembering to wear my Fitbit, which is why fitbits haven't really worked for me in the past. The reminders were great though because if I forgot to put my Fitbit on I would then put it on.

Can you tell me about your typical experience getting a text message? Did that change over time?

Yes! I loved it because it helped me remember to wear my Fitbit and it would remind me that I needed to get up and walk around if I was at my desk.

Tell me about how the text messages influenced how much you walked each day.

I walked a little bit more.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Because my husband was doing it too, it helped remind me that I needed to do it

What did you enjoy the most about your experience?

Moving around more at work since I have a desk job

What frustrated you the most about your experience?

Forgetting to put on the fitbit

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Can't think of anything

Is there anything else you want to tell me about your experience?

Nope

CASE #14 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Good, not too intrusive.

Can you tell me about your typical experience getting a text message? Did that change over time?

I wasn't as good at paying attention to the texts over time.

Tell me about how the text messages influenced how much you walked each day.

My work setting changed during the experience which had a major impact on how well I adhered to the texts.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

Additional influence to be healthier.

What frustrated you the most about your experience?

Nothing

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Maybe group testing to get friends/family involved.

Is there anything else you want to tell me about your experience?

Nah

CASE #17 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Non-intrusive

Can you tell me about your typical experience getting a text message? Did that change over time?

It was just one more message that I receive daily. At first it was a reminder. Over time I started ignoring it.

Tell me about how the text messages influenced how much you walked each day.

No much. When I'm at work I remained pretty focused. I would mostly ignore the messages after the initial weeks.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

I have worn activity trackers in the past and it reminded me why.

What frustrated you the most about your experience?

Charging the device and the connectivity issues.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

The device vibrating would be more incouraging rather than a standard phone message.

Is there anything else you want to tell me about your experience?

I bought a newer and more feature rich device after the experience and have been tracking my activity again.

CASE #18 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Getting the texts were nice, as they did remind me that I should be more active, but at the end of the day I think there were only a handful of times that I actually went out and walked as a direct result of it.

Can you tell me about your typical experience getting a text message? Did that change over time?

I was mostly getting the messages and not necessarily acting on them. Don't recall a change over time.

Tell me about how the text messages influenced how much you walked each day.

I think for the majority they didn't have much influence. I would certainly see the message, but if the timing wasn't right I would not end up doing anything and ultimately forgetting.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Only co-workers, we would all go on walks sometimes once a day.

What did you enjoy the most about your experience?

Getting personalized reminders was nice, and did make me want to do better, and be more active.

What frustrated you the most about your experience?

Usually the timing was never great for me, so if I was in a window where I couldn't go at that time, I would usually forget and ultimately it would never happen.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Personalized times for the reminders to be sent, based on the persons schedule, to give maximum chance for success. What if in the text you were able to somehow send my previous days or weeks weight so I could be reminded that I was up 2 pounds from last week or whatever.

Is there anything else you want to tell me about your experience?

Wearing the bracelets is annoying, there should be a easier way to collect info.

CASE #19 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

It was interesting... I didn't realize how much time I DON'T have during the day until the reminders asked me to walk! I also thought the band would get annoying and / or be an inconvenience, and it really wasn't.

Can you tell me about your typical experience getting a text message? Did that change over time?

I noticed them more at first. They weren't intrusive, but sometimes I had to ignore them a bit if I was focused or in a meeting. Over time, I knew exactly when they'd come, and I found myself ignoring the notification just because I knew what it was for.

Tell me about how the text messages influenced how much you walked each day.

Not as much as I would like. I found that most of the time, I was in a flow or in a meeting. They definitely got me thinking about it, which is good, but I didn't act on then unless I absolutely had to.

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Not really. I was on an island of sorts. Working for a startup can be tough, and extracurricular is usually the first thing to go. Friends and family knew I was doing the experiment, but they weren't really encouraging or discouraging.

What did you enjoy the most about your experience?

The feeling of knowing I was helping someone, especially since it was research and having to do with their degree. I did enjoy getting the notifications and increasing that awareness to take a break even if I couldn't.

What frustrated you the most about your experience?

Just the timing... Not being able to walk if I was busy, which was a lot. If I could've "snoozed" the reminder, that might've helped. I also got frustrated with myself for ignoring the notifications as I got used to the timing.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Snoozing the reminder... Putting it off just a little bit so I didn't just forget about it. Also, having more randomized timing... Especially in the afternoon.

Is there anything else you want to tell me about your experience?

I thoroughly enjoyed it, even if I wasn't the best test subject. Awesome to be able to help out a fellow mind farmer too! Thought it was an excellent topic and David had GREAT execution!

CASE #21 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

It was pretty neutral.

Can you tell me about your typical experience getting a text message? Did that change over time?

Most of the time the text messages would come at pretty inconvenient times so I didn't really do what they asked for. That did not change over time.

Tell me about how the text messages influenced how much you walked each day.

The messages did not seem to influence me

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

Not specifically about walking more, no.

What did you enjoy the most about your experience?

Like I said it was pretty neutral. There wasn't a particular part that stood out to me

What frustrated you the most about your experience?

Sometimes the text messages would come at very inconvenient times and that would be annoying. The wording of the messages was annoying too

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Providing information about how much I have walked already would help

Is there anything else you want to tell me about your experience?

Not really

CASE #24 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Overall, pretty good. While my office provides a gym, I used the walk reminders as an opportunity to actually take a break and go outside.

Can you tell me about your typical experience getting a text message? Did that change over time?

It wasn't really a problem, because it's not like I was being texted incessantly. I sort-of came to expect them, since I knew what time they'd arrive, but that the message itself varied was a nice thing.

Tell me about how the text messages influenced how much you walked each day.

Some days, there was no effect. Not so much due to lack of interest and more so that I had so much work or was in a meeting. Even if it was something I wanted to do later (rather than right when I got the message), some days there was no "later."

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

I did not, and would have liked to have a work friend be given the same challenge. Or make it a team activity, time permitting. I think I could have engaged friends and family outside of work to assist me with walking (or other exercise), but I usually have such little energy to commit.

What did you enjoy the most about your experience?

The times when I was able to be outside and walk for about 30 minutes. Definitely nice to be away from my desk, and also a little bit unavailable to colleagues (wink, wink). Can't be told to do something if you can't be found!

What frustrated you the most about your experience?

Lack of ability to interact, I think. Might've been nice if I texted back to the number I was receiving texts from to say "hey, I did it! Log [x unit] for today". Which maybe I could have done if using the Fitbit app was permitted? IDK. And yeah, not really being able to grab a friend to accompany me.

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Not sure. I'm drawing a blank here.

Is there anything else you want to tell me about your experience?

I wish I'd written things down, because I assumed this survey would've came shortly after the testing period had ended. By now, I've forgotten a lot about it and do not go out of my way to walk outside (inclement winter weather/temperatures).

CASE #26 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Aside from technical issues, it was fine however the reminders didn't change my normal rutine

Can you tell me about your typical experience getting a text message? Did that change over time?

At the beginning i was checking my phone every time but at the end I stop paying attention to my phone so much

Tell me about how the text messages influenced how much you walked each day.

I didn't walk that much, the text message helped to minimize the use of the phone

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

I glad I did it because it was something new to try

What frustrated you the most about your experience?

The technical isssues

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Add some reward for it

Is there anything else you want to tell me about your experience?

It was fun to try it out

CASE #35 (LONE PARTICIPANT) SURVEY RESPONSES

What was your experience like?

Average, the device was easy to lose and required a third party app to locate

Can you tell me about your typical experience getting a text message? Did that change over time?

Arrived pretty frequently, was able to use some, not others. No change that I noticed

Tell me about how the text messages influenced how much you walked each day.

Usually the reminder was helpful, sometimes I was too busy to follow through

Did you have any social support—family, peers, or others—that helped encourage you? Please explain.

No

What did you enjoy the most about your experience?

Helping out in the study

What frustrated you the most about your experience?

Losing the device

What could we improve or change to make the intervention more effective at increasing the amount you walk each day?

Not sure

Is there anything else you want to tell me about your experience?

No

Appendix H

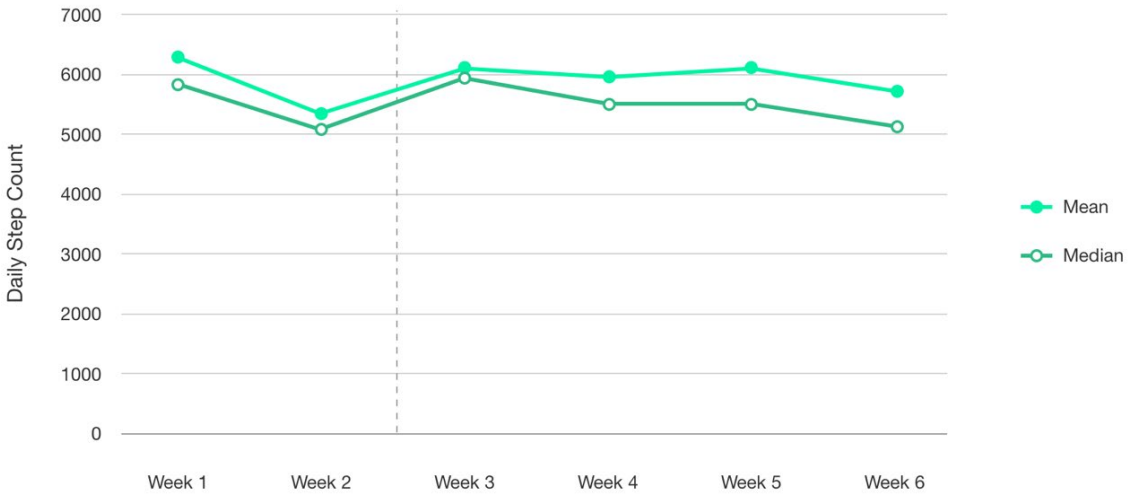
Additional Figures and Tables

Descriptive Statistcs for All Participants

Mean and median daily step counts for all participants were computed for each of the six weeks of the study (see Figure H-1). Mean, median, and range of daily step counts were computed for the baseline establishment weeks and intervention weeks (see Figure H-2). During the baseline establishment weeks, median step count for all participants was 5436 (*M* = 5,807, *SD* = 3,065), and ranged from 17 to 16806. During the intervention weeks, median step count for all participants was 5,510 (*M* = 5,941, *SD* = 3,393), and ranged from 4 to 26,610.

Figure 17

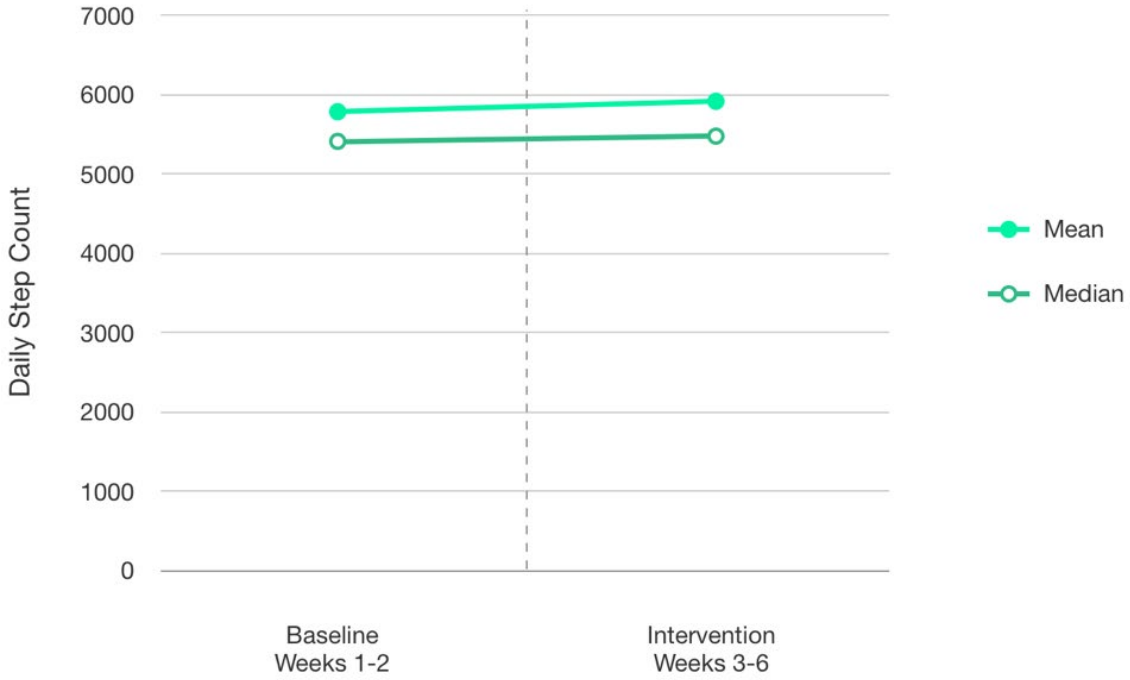
Participant Step Count by Week



Note. Mean and median of daily step count for all participants by week.

Figure H-2

Step Count Baseline and Intervention

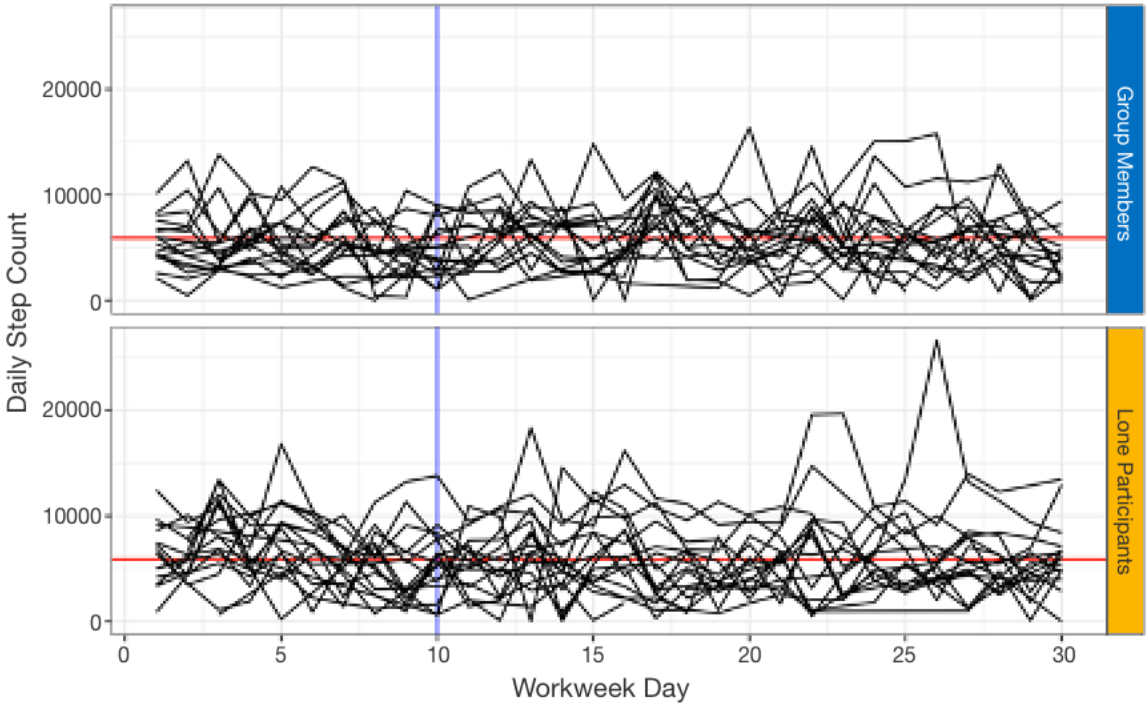


Note. Mean and median of daily step count for all participants remained mostly consistent over time, increasing slightly from baseline establishment weeks to intervention weeks.

Person-Profile Plots

Figure 18

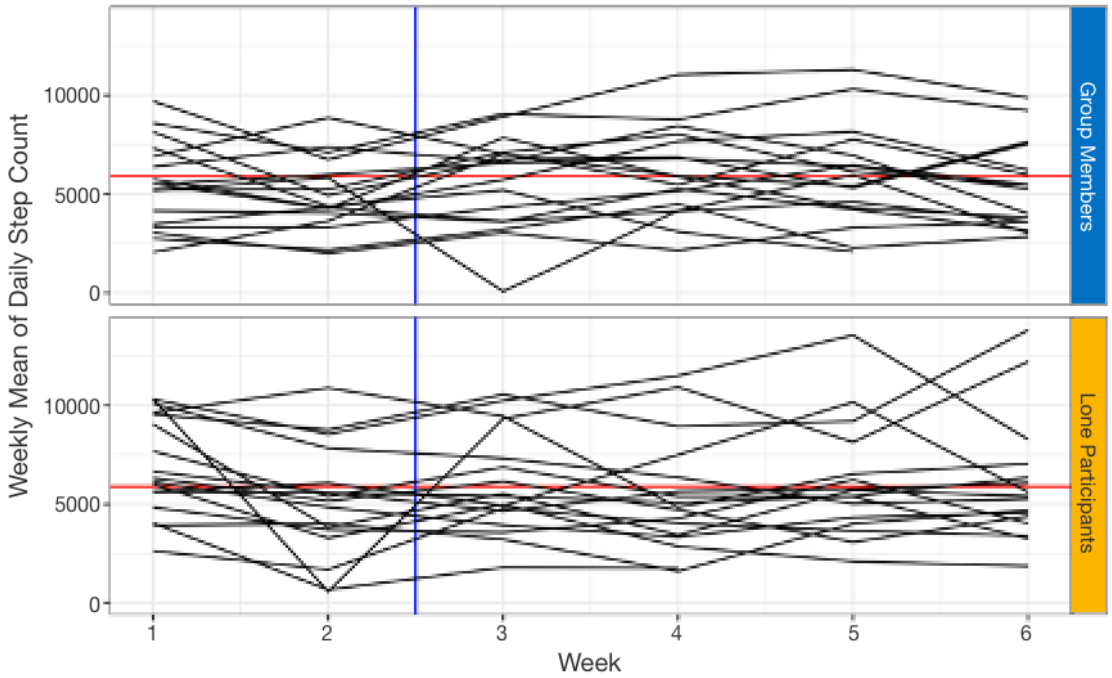
Person-Profile Plots by Day



Note. Person-profile plots showing daily step count by participant type, where the vertical blue line indicates intervention start, and the red horizontal line indicates overall mean of daily step count.

Figure H-4

Person-Profile Plots by Week

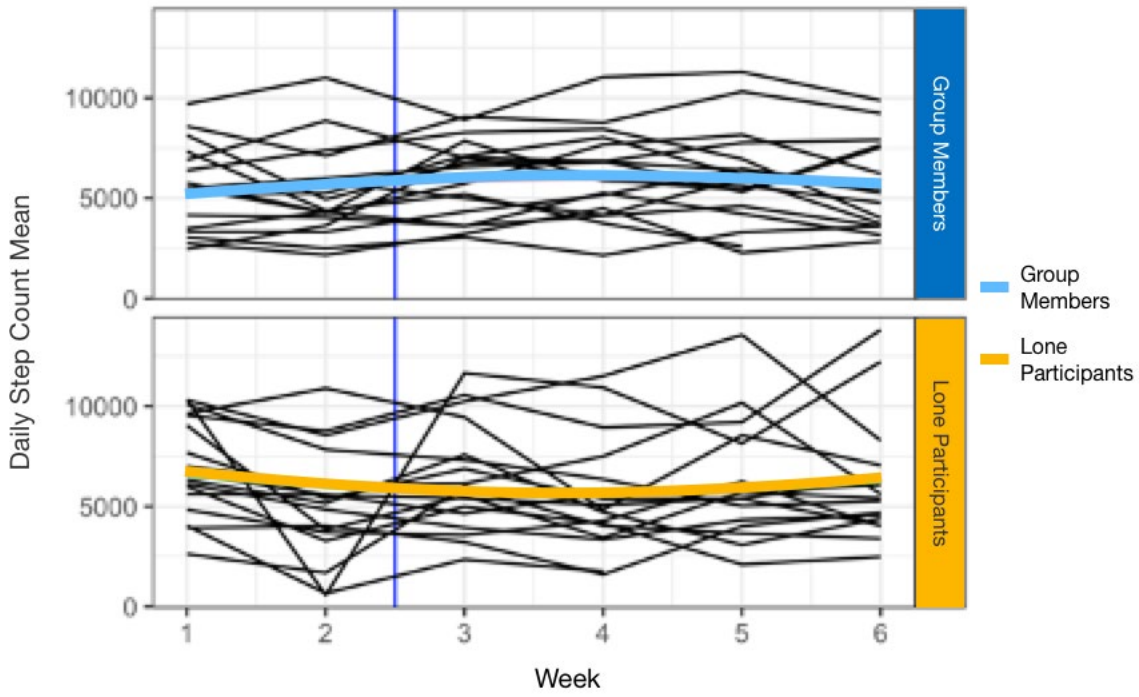


Note. Person-profile plots showing weekly mean of daily step count by participant type, where the vertical blue line indicates intervention start, and the red horizontal line indicates overall daily step mean.

Smoothed Aggregate Curve of Weekly Profile Plots

Figure 19

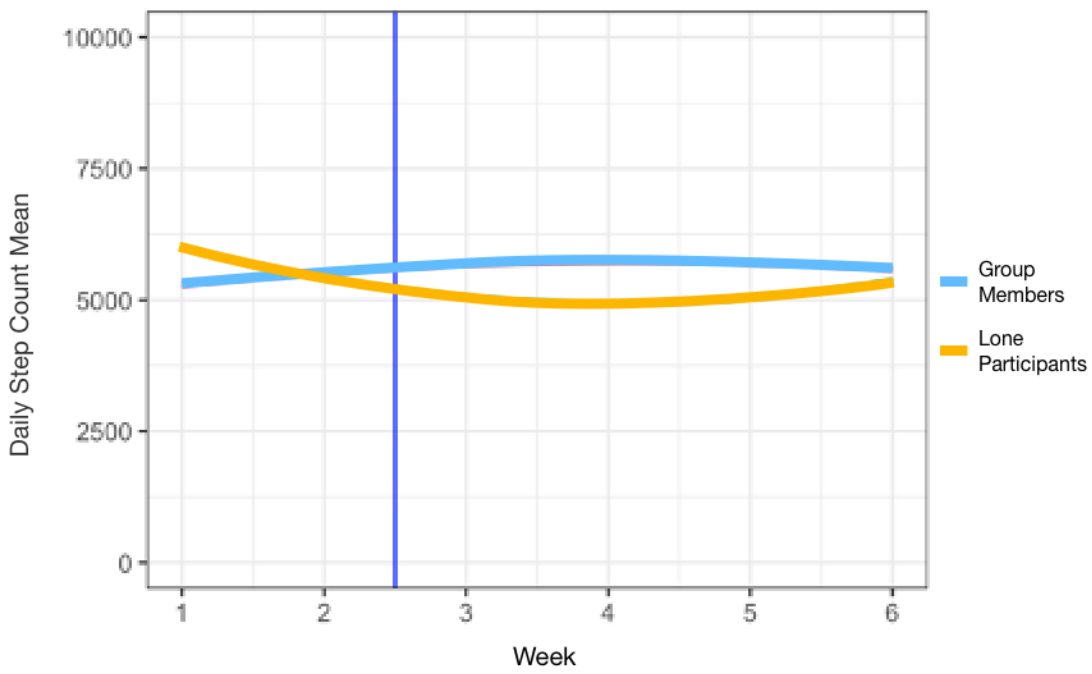
Person-Profile Plots with Aggregate Curve Overlay



Note. The smoothed aggregate curves overlayed on individual weekly means plots show a general downward trend among lone participants and upward trend among cohesive group unit members.

Figure H-6

Aggregate Step Count Means Curve

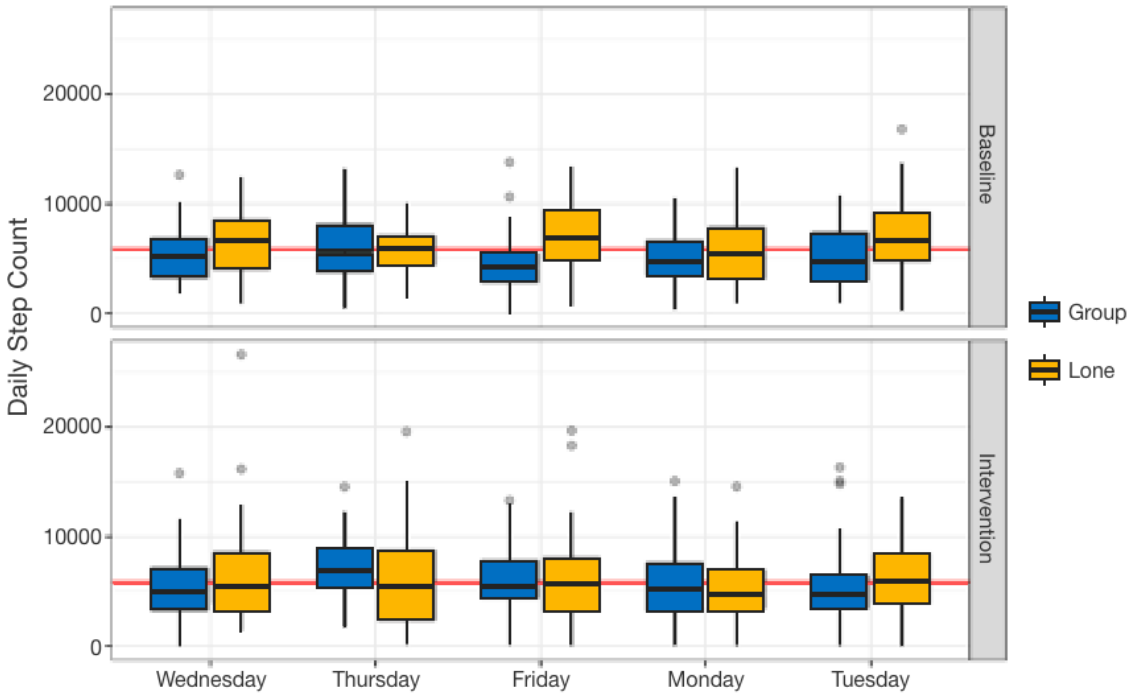


Note. The smoothed aggregate curves of weekly mean of daily step count show a general downward trend among lone participants and upward trend among cohesive group unit members (individual plots removed).

Box Plots

Figure 20

Box Plots of Daily Step Count by Workweek Day

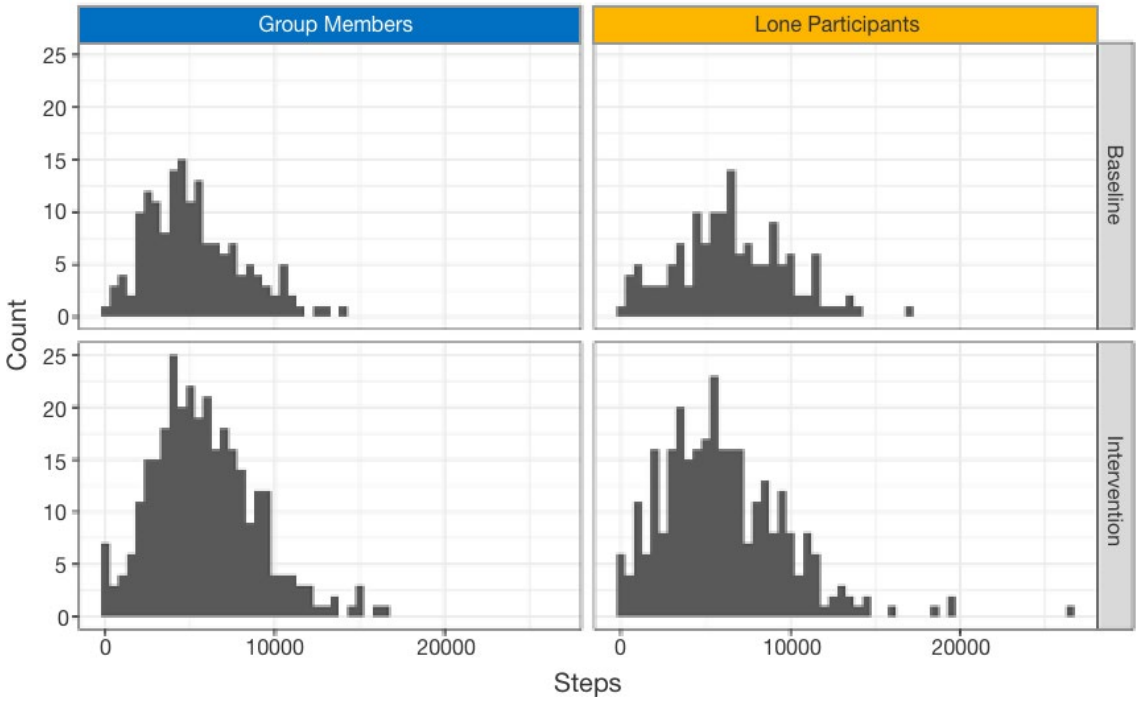


Note. Box plots showing mean, range, and quartiles for daily step count by workweek day, where the red horizontal line indicates overall daily step count mean, and gray dots are outliers.

Histogram

Figure H-8

Histogram of Daily Step Counts from Baseline to Intervention



Note. A histogram showing occurrence of daily step counts during baseline establishment weeks and intervention weeks, segmented by participant type.

Pairwise Test for 2x6 mixANOVA

Table H-1

Significant Difference of Step Count by Week

Week	Mean of Daily Step Count		Significant Difference
	Group Members	Lone Participants	
Week 1	5396	7235	$t(54) = 2.03$, $p = .048$
Week 2	5272	5365	$t(54) = 0.10$, $p = .919$
Week 3	6143	6695	$t(54) = 0.61$, $p = .546$
Week 4	6497	5736	$t(54) = 0.84$, $p = .406$
Week 5	6284	6273	$t(54) = 0.01$, $p = .990$
Week 6	5774	6108	$t(54) = 0.37$, $p = .715$

Significant difference No significant difference

Note. Weekly estimated marginal means of daily step count for group members and lone participants were significantly different only at week one.

Appendix I

Peripheral Themes

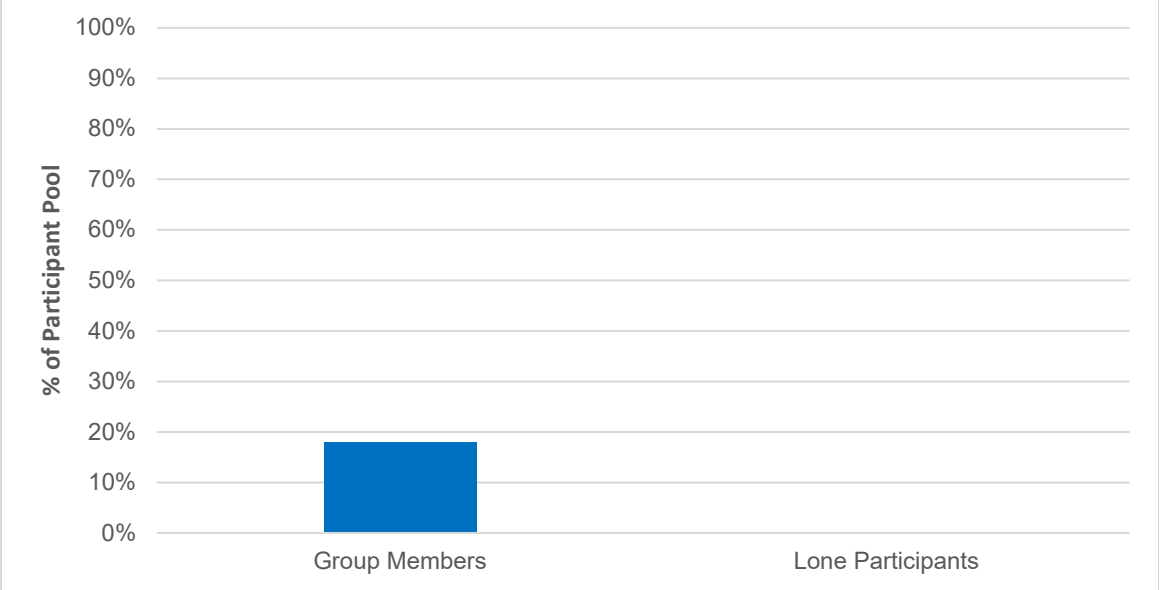
PERIPHERAL THEMES

Monitoring

In postexperimental surveys and interviews, some of the participants described their awareness of being monitored as a contributing factor in overall treatment efficacy (see I-1). This included participants like Case #05 (group member), who wrote, "I felt like wearing thw [sic] fitbit [sic] and knowing my steps were being monitored affected my behavior." Of the 31 total participants who provided feedback, 3 (10%) indicated that being monitored increased the amount they walked during the experiment. None of the 14 lone participants who provided feedback indicated that being monitored increased the amount they walked during the experiment. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that being monitored increased the amount they walked during the experiment.

Figure I-1

Impact of Being Monitored



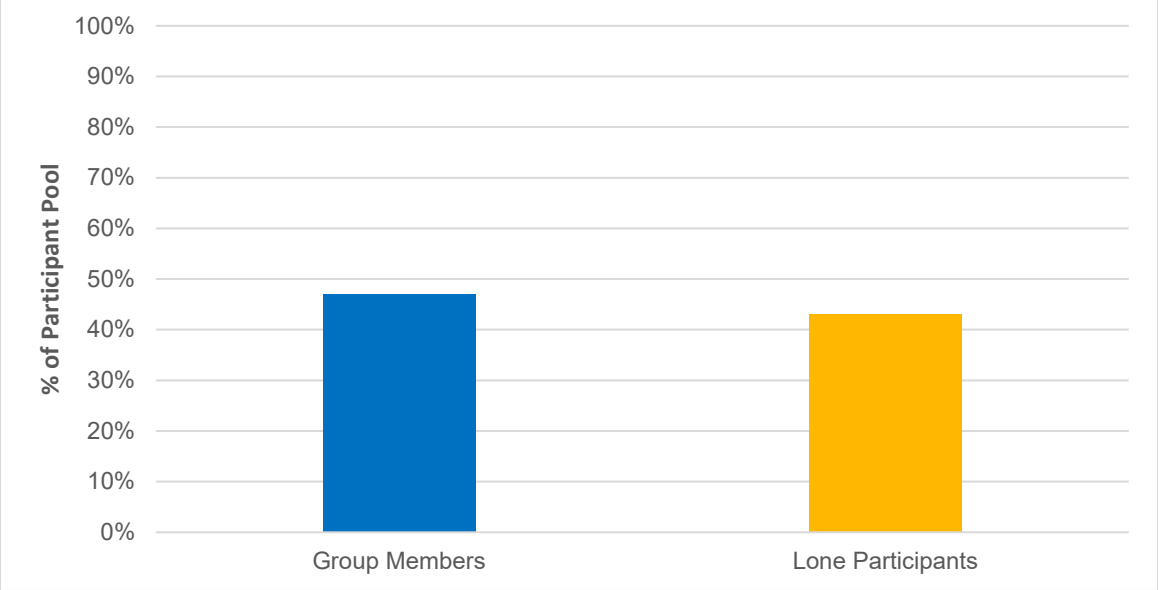
Note. Self-assessed positive impact that being monitored had on step count, segmented by participant pool.

Awareness

In postexperimental surveys and interviews, some of the participants described an increased awareness of their walking habits, including isolated or recurring thoughts about walking, as a result of their participation in the experiment (see Figure I-2). This included participants like Case #15 (group member), who wrote of the text messages, "[they] certainly kept my mind on walking…" This also includes participants who indicated the reminders impacted their thinking but not their behavior, such as Case #12 (group member) who wrote, "I think it helped me realize I needed to do more but not having time [sic] at the moment." Of the 31 total participants who provided feedback, 14 (45%) indicated that they experienced increased awareness of their walking habits. Of the 14 lone participants who provided feedback, 6 (43%) indicated that they experienced increased awareness of their walking habits. Of the 17 cohesive group unit members who

Figure I-2

Increased Awareness of Walking



Note. Self-assessed impact of treatment on awareness of walking habits, segmented by participant pool.

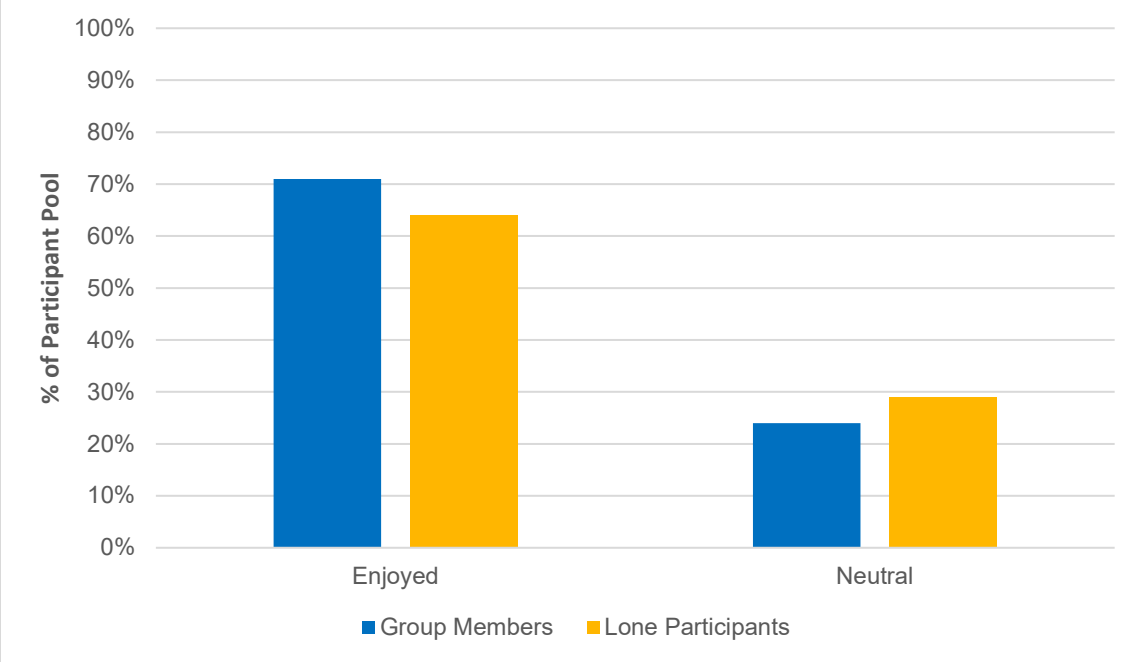
provided feedback, 8 (47%) indicated that they experienced increased awareness of their walking habits.

Enjoyment

In postexperimental surveys and interviews, participants described their participation in the experiment as either enjoyable or neutral (see Figure I-3). Participants who described the experience as enjoyable included those like Case #12 (group member) who said their experience was "[g]enerally good," and Participant 16, who when asked about their experience overall wrote simply, "Enjoyed." Of the 31 total participants who provided feedback, 21 (68%) indicated that they enjoyed participating in the experiment. Of the 14 lone participants who provided feedback, 9 (64%) indicated that they enjoyed

Figure I-3

Participant Enjoyment



Note. Reported level of treatment enjoyment, segmented by participant pool.

participating in the experiment. Of the 17 cohesive group unit members who provided feedback, 12 (71%) indicated that they enjoyed participating in the experiment.

Participants who described their participation as neutral included Case #21 (lone participant), who said their experience was "pretty neutral," and Case #35 (lone participant), who described their experience as "[a]verage." Of the 31 total participants who provided feedback, 8 (26%) indicated that they felt neutral regarding their participation in terms of enjoyment. Of the 14 lone participants who provided feedback, 4 (29%) indicated that they felt neutral regarding their participation. Of the 17 cohesive group unit members who provided feedback, 4 (24%) indicated that they felt neutral about participating.

Sources of Social Support

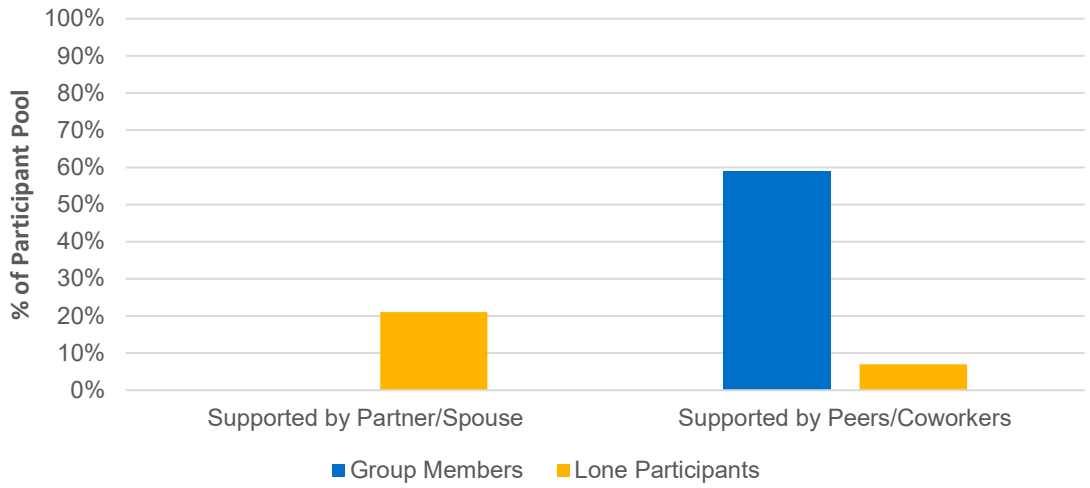
Of the 15 socially supported participants, 3 described receiving social support from their partner or spouse, and 12 described receiving support from their coworkers (see Figure I-4). The 3 participants who described receiving social support from their partner or spouse were lone participants. Eleven of the 12 participants who described receiving social support from their coworkers were cohesive group unit members.

Timing

SMS prompts were sent to participants at 11:30 a.m. and 2:30 p.m. each weekday during the final four weeks of the experiment. In the postexperimental surveys and interviews, participants described how they felt about the timing of those messages (see Figure I-5). Those who described the timing positively included participants like Case

Figure I-4

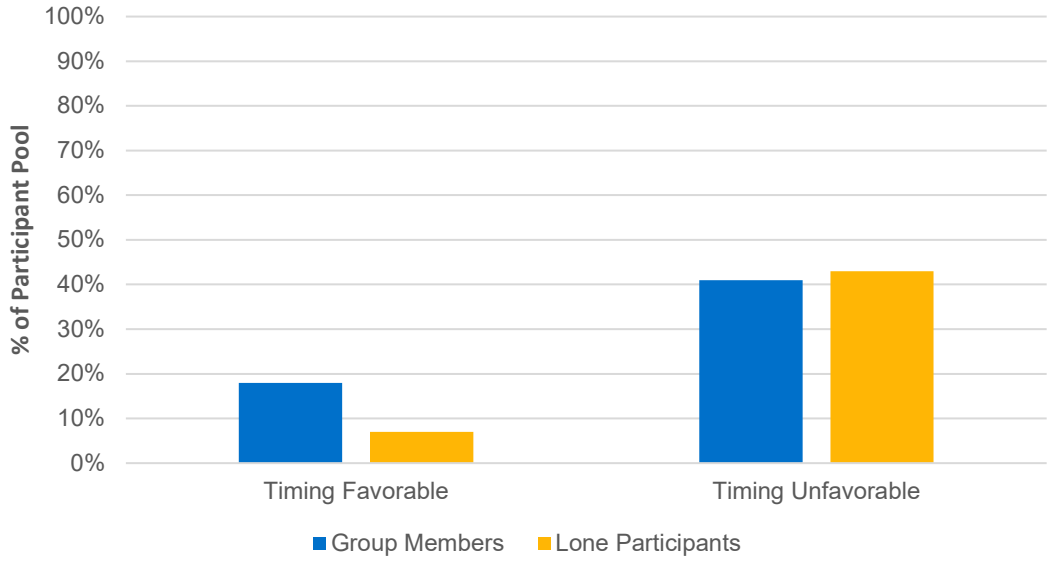
Social Support Sources



Note. Self-assessed sources of social support, segmented by participant pool.

Figure I-5

Feedback Regarding Timing of Prompts



Note. Participant feedback on the timing of the text reminders, segmented by participant pool.

#02, who said "the timing is fine," and Case #02, who said in reference to delivery times, "that worked." Of the 31 total participants who provided feedback, 4 (13%) made positive comments about the timing of the messages. Of the 14 lone participants who provided feedback, 1 (7%) made positive comments about the timing of the messages. Of the 17 cohesive group unit members who provided feedback, 3 (18%) made positive comments about the timing of the messages.

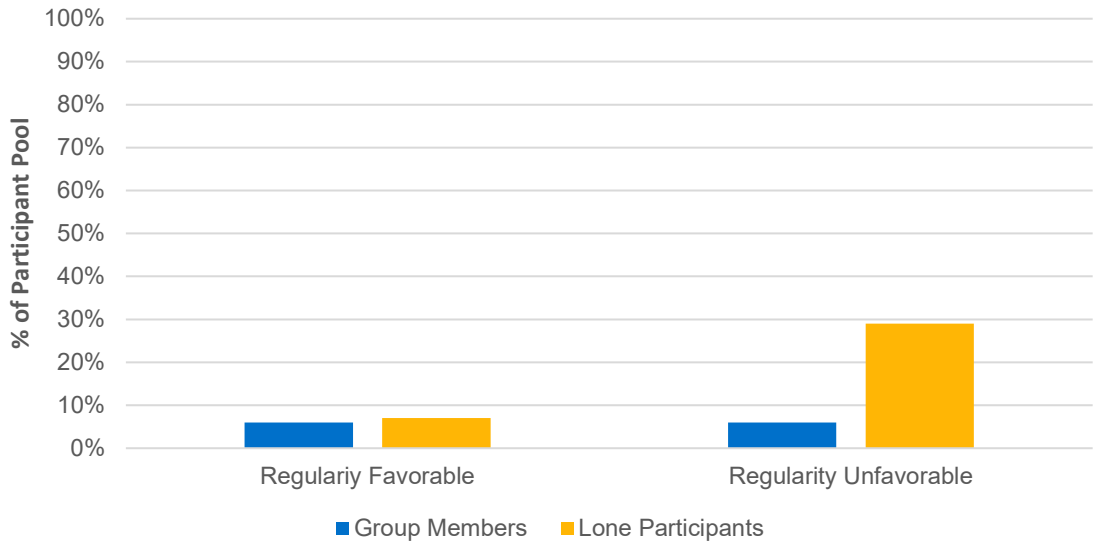
Participants who gave negative feedback about the message delivery timing included participants like Case #16 (group member), who wrote, "One issue I experienced was that I was often very busy at the two times of day I would receive the texts," and Case #21 (lone participant), who wrote "Most of the time the text messages would come at pretty inconvenient times…" Of the 31 total participants who provided feedback, 13 (42%) indicated that they would have preferred to receive the text reminders at different times. Of the 14 lone participants who provided feedback, 6 (43%) indicated that they would have preferred to receive the text reminders at different times. Of the 17 cohesive group unit members who provided feedback, 7 (41%) indicated that they would have preferred to receive the text reminders at different times.

The timing of the delivery of the SMS prompts was consistent throughout the experiment. In postexperimental surveys and interviews, participants also described the regularity of the message delivery in positive and negative terms (see Figure I-6), meaning the expectation of receiving the text at the same time each day lead participants to either habitually walk or habitually ignore the messages.

Participants who described the regularity of the message delivery times as

Figure I-6

Feedback Regarding Regularity of Prompts



Note. Participant feedback on the regularity of the text reminders, segmented by participant pool.

positive included participants like Case #03 (group member), who wrote, "I got used to getting the message and taking action…" and Case #22 (lone participant), who said that having the messages delivered at the same times each day was "extremely beneficial." Of the 31 total participants who provided feedback, 2 (6%) indicated that that the regularity of the text messages was positive. Of the 14 lone participants who provided feedback, 1 (7%) indicated that that the regularity of the text messages was positive. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that that the regularity of the text messages was positive.

Participants who gave negative feedback about the regularity of the text messages included participants like Case #19 (lone participant), who wrote, "It was as if I had set up a reminder to go off on a regular interval, so after a while I started ignoring it." Of the

31 total participants who provided feedback, 4 (13%) indicated that that the regularity of the text messages was negative. Of the 14 lone participants who provided feedback, 4 (29%) indicated that that the regularity of the text messages was negative. None of the 17 cohesive group unit members who provided feedback indicated that that the regularity of the text messages was negative.

Frequency

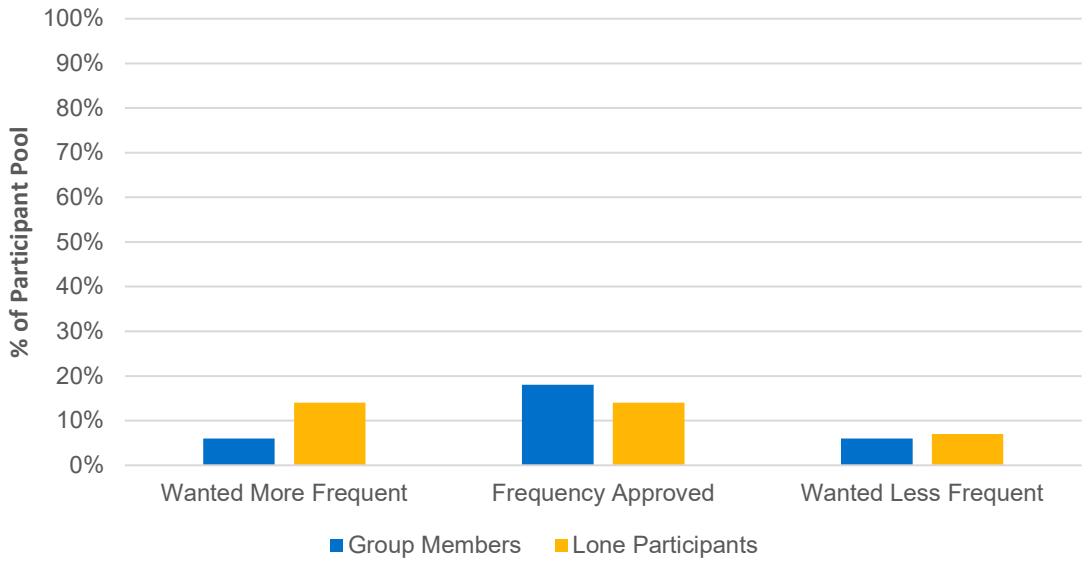
SMS reminders were sent to participants twice per weekday during that final four weeks of the experiment. In postexperimental surveys and interviews, participants indicated that they either wanted to receive reminders more than twice per day, that they were happy with two reminders per day, or that they wanted to receive reminders less than twice per day (see Figure I-7).

Participants who indicated that they would have preferred more frequent reminders included participants like Case #28 (lone participant), who said, “Maybe three times a day would have been nice,” and Case #06 (lone participant), who wrote, “More messages at different times throughout the day [would improve efficacy].” Of the 31 total participants who provided feedback, 3 (10%) indicated that they would have provided feedback, 2 (14%) indicated that they would have preferred more frequent text message reminders. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that they would have preferred more frequent text message reminders.

Participants who indicated that they were happy with two reminders per day included participants like Case #22 (lone participant), who said the frequency “was okay…I think two texts is actually fine,” and Case #02 (group member), who said two

Figure I-7

Feedback Regarding Frequency of Prompts



Note. Participant feedback on the frequency of the text reminders, segmented by participant pool.

texts per day "was good…that seem like it fit. It wasn't too frequent. It was perfect." Of the 31 total participants who provided feedback, 5 (16%) indicated that two messages per day was an ideal frequency. Of the 14 lone participants who provided feedback, 2 (14%) indicated that two messages per day was an ideal frequency. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that two messages per day was an ideal frequency.

Of the 31 total participants who provided feedback, 2 (6%) indicated that they would have preferred less frequent text message reminders. This included Case #31 (group member), who wrote "Depending on the day, the high frequency of text messages compared to how busy I was would encourage me to dismiss and ignore them," and Case

#35, who wrote that the reminders "[a]rrived pretty frequently." Of the 14 lone participants who provided feedback, 1 (7%) indicated that they would have preferred less frequent text message reminders. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that they would have preferred less frequent text message reminders.

Work Disruption

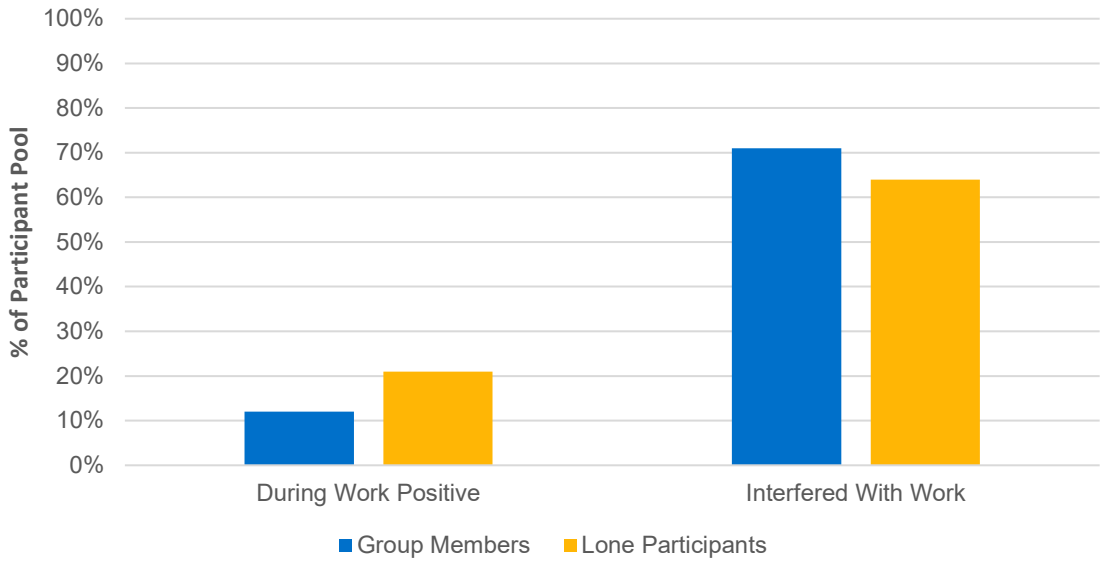
In postexperimental surveys and interviews, participants described receiving SMS prompts during work hours as being either a positive or negative experience (see Figure I-8). The participants who described receiving reminder texts during work hours as positive indicated they saw the texts as opportunities to take a break. This included participants like Case #02 (group member), who said receiving texts prompts "would just kind of let me be able to unplug for a little bit and just walk…it felt good coming back to that," and Case #06 (lone participant), who described their overall experience as "[g]ood. I found that when I received reminders it helped me get away from my desk more frequently."

Of the 31 total participants who provided feedback, 5 (16%) indicated that they enjoyed receiving text message reminders to walk during the workday. Of the 14 lone participants who provided feedback, 3 (21%) indicated that they enjoyed receiving text message reminders to walk during the workday. Of the 17 cohesive group unit members who provided feedback, 2 (12%) indicated that they enjoyed receiving text message reminders to walk during the workday.

The participants who described receiving texts at work as negative indicated that

Figure I-8

Feedback Regarding Prompts During Work



Note. Participant feedback regarding prompting taking place during work hours, segmented by participant pool.

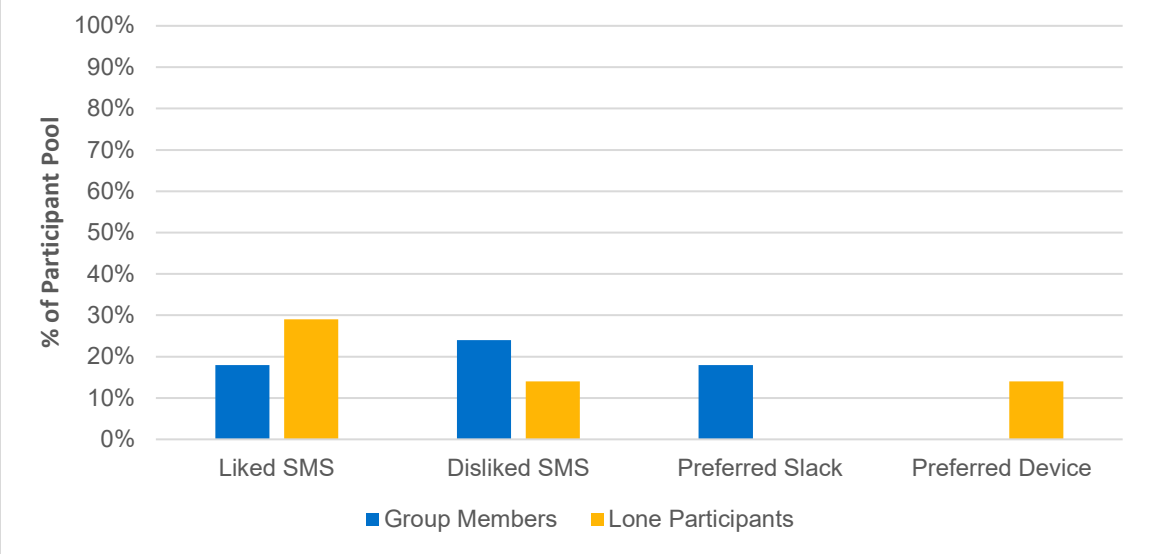
they were too busy with work or meetings to respond to the prompts. This includes participants like Case #09 (lone participant), who wrote, "I usually got the text while I was in the middle of work so I just dismissed it," and Case #24 (lone participant), who wrote "Some days, there was no effect. Not so much due to lack of interest and more so that I had so much work or was in a meeting." Of the 31 total participants who provided feedback, 21 (68%) indicated that the text reminders interfered with their work. Of the 14 lone participants who provided feedback, 9 (64%) indicated that the text reminders interfered with their work. Of the 17 cohesive group unit members who provided feedback, 12 (71%) indicated that the text reminders interfered with their work.

Format

The walk reminder prompts were delivered in the form of SMS messages. In postexperimental surveys and interviews, participants described the delivery format of SMS texts as either positive or negative (see Figure I-9). Participants who described the SMS format as positive indicated that they liked receiving reminders as texts, or that it was an effective method of delivery. This included participants like Case #034 (group member), who wrote, "It was an unobtrusive way to remind me to stand up and walk," and Case #01 (group member), who wrote "I felt like it worked as a reminder." Of the 31 total participants who provided feedback, 7 (23%) described the SMS format as positive. Of the 14 lone participants who provided feedback, 4 (29%) described the SMS format as positive. Of the 17 cohesive group unit members who provided feedback, 3 (18%) described the SMS format as positive.

Figure I-9

Feedback Regarding Format of Prompts



Note. Participant feedback on SMS messages as a delivery format for activity prompts, segmented by participant pool.

Participants who described the format as negative indicated that the text message reminders were easy to miss or easy to ignore, or that another delivery format would have been more appropriate. This included participants such as Case #17 (lone participant), who wrote, “The device vibrating would be more incouraging [sic] rather than a standard phone message,” or Case #04 (group member), who wrote, “The texts were about as helpful as a push notification. It was easy to ignore and miss the walk during the day.”

Of the 31 total participants who provided feedback, 6 (19%) indicated that SMS messages did not work well as a delivery format for the activity prompts. Of the 14 lone participants who provided feedback, 2 (14%) indicated that SMS messages did not work well as a delivery format. Of the 17 cohesive group unit members who provided feedback, 4 (24%) indicated that SMS messages did not work well as a delivery format.

Some of the participants indicated that Slack messages would have been a preferable delivery format for the activity prompts. This included Case #07 (group member), who said, “Because I am at work and not as much on my phone, probably getting a Slack message [would have been better],” as well as Case #13 (group member), who said, “I pay attention to Slack, I don’t pay attention to my phone.” Of the 31 total participants who provided feedback, 3 (10%) indicated that Slack messages would have worked better as a delivery format. They were all cohesive group unit members, representing 18% of the 17 cohesive group unit members.

Some of the participants indicated that receiving messages on the Fitbit device itself would have been a preferable delivery format for the activity prompts. Case #22 (lone participant) said, “…some of the Fitbits probably do have messages on them, but it

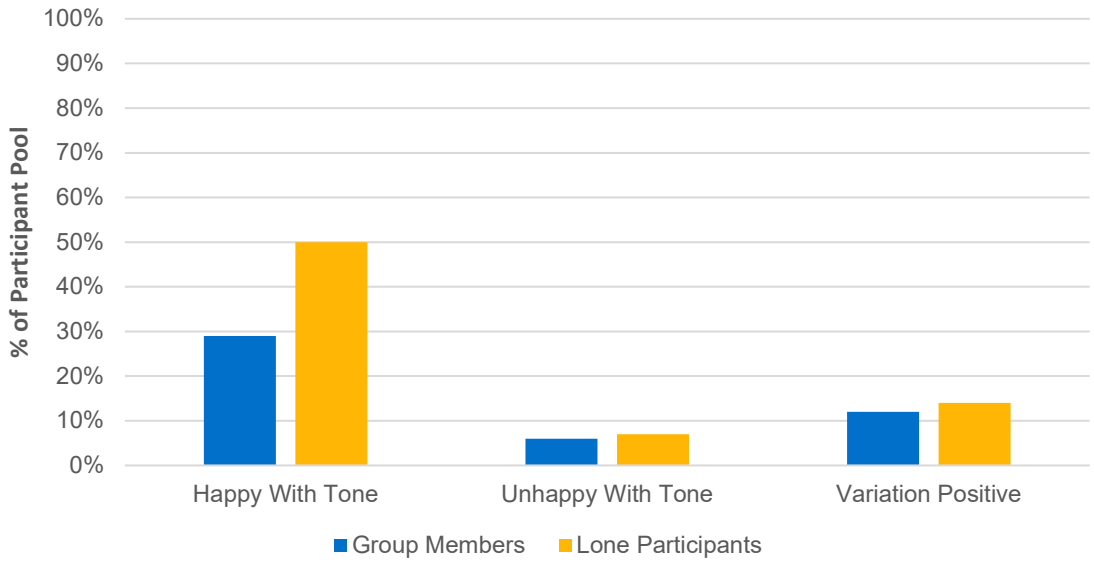
could have been nice having just connected to the device itself." Of the 31 total participants who provided feedback, 2 (6%) indicated that the Fitbit itself would have worked better as a delivery format for the activity prompts. They were both lone participants, representing 14% of the 14 lone participants.

Message Content

In postexperimental surveys and interviews, participants were discussed their satisfaction with the tone and content of the text reminders (see Figure I-10). Participants were categorized as happy with the tone and content if they described the messages using positive adjectives, such as friendly, nice, or fun. This included participants such as Case #34 (group member), who wrote that the prompts "came in with different messages which made it seem less like a standard reminder. It was never annoying," and Case #31

Figure I-10

Feedback Regarding Tone and Content of Prompts



Note. Participant feedback on the content and tone of the activity prompts, segmented by participant pool.

(group member), who wrote, “The friendliness of the messages was more of a helpful guide to make me think I should get out and move.”

Of the 31 total participants who provided feedback, 12 (39%) indicated that they were happy with the tone of the text reminders. Of the 14 lone participants who provided feedback, 7 (50%) indicated that they were happy with the tone of the text reminders. Of the 17 cohesive group unit members who provided feedback, 5 (29%) indicated that they were happy with the tone of the text reminders.

Some of the participants specifically mentioned that they appreciated the variety of the content of the messages. This included Case #24 (lone participant), who wrote “…that the message itself varied was a nice thing.” Of the 31 total participants who provided feedback, 4 (13%) indicated that they enjoyed the amount of content variety in the text reminders. Of the 14 lone participants who provided feedback, 2 (14%) indicated that they enjoyed the amount of content variety in the text reminders. Of the 17 cohesive group unit members who provided feedback, 2 (12%) indicated that they enjoyed the amount of content variety in the text reminders.

Participants were categorized as disliking the tone and content of the activity prompts if they described the tone or content negatively. This included participants like Case #21, who wrote, “The wording of the messages was annoying,” and Case #30 (group member), who wrote, “It felt like the texts I get for other reminders like sales or political action, which I'd mostly put to the side and forget.” Of the 31 total participants who provided feedback, 2 (6%) indicated that they disliked the tone or content of the activity prompts. Of the 14 lone participants who provided feedback, 1 (7%) indicated

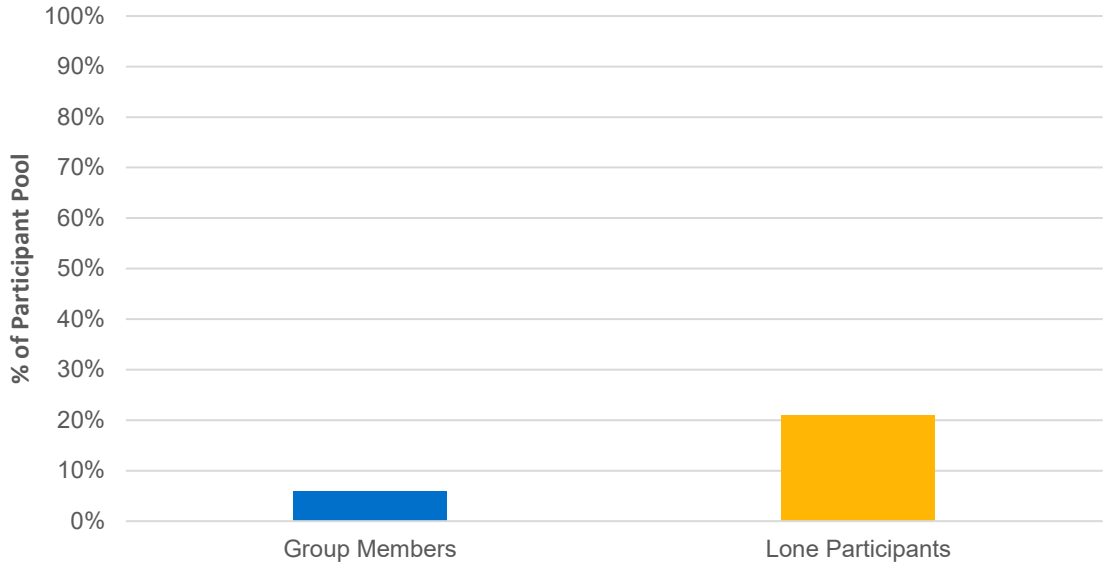
that they disliked the tone or content of the activity prompts. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that they disliked the tone of the activity prompts.

Physical Environment

In postexperimental surveys and interviews, some participants described their environment as a factor in treatment efficacy (see Figure I-11). This included Case #14 (lone participant), who wrote, "My work setting changed during the experience which had a major impact on how well I adhered to the texts," and Case #07 (group member), who said, "…my last job…had a botanical garden with walking paths on it…It's like having a distinct place to go, I'm realizing really influenced me as opposed to [my current job]."

Figure I-11

Physical Environment as a Factor



Note. Reporting of physical environment as a factor affecting treatment efficacy, segmented by participant pool.

Of the 31 total participants who provided feedback, 4 (13%) indicated that their environment had an effect on treatment efficacy or their behavior. Of the 14 lone participants who provided feedback, 3 (21%) indicated that their environment was a factor. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that their environment was a factor.

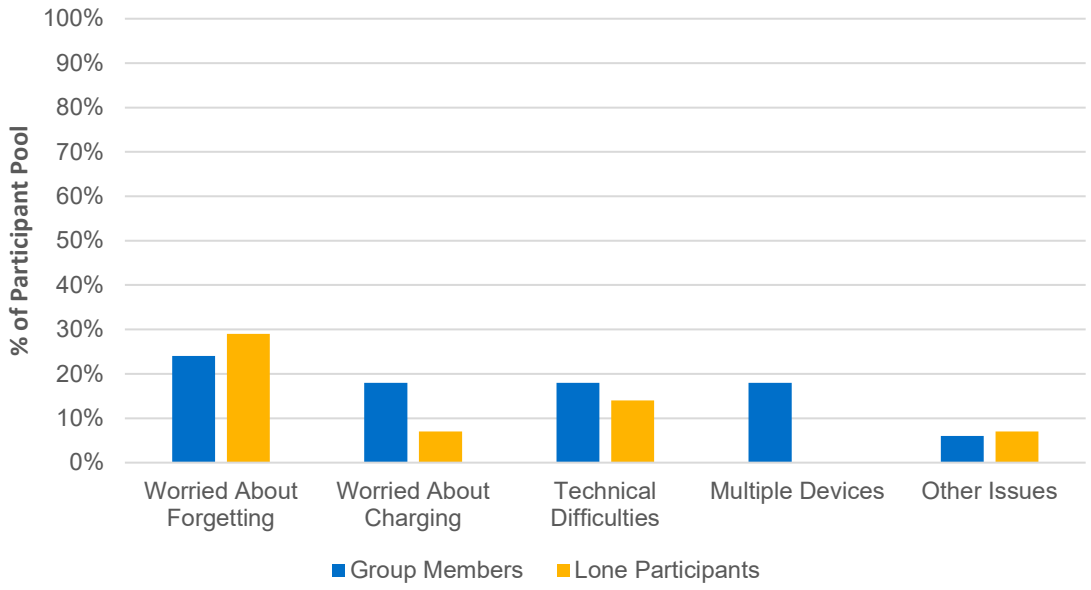
Device

In postexperimental surveys and interviews, participants described problems they had with the Fitbit device or the Fitbit wristband (see Figure I-12). Complaints about the Fitbit wristband included difficulty putting on the wristband, disliking wearing the wristband, the wristband falling off too easily, or the wristband being uncomfortable. Of the 31 total participants who provided feedback, 6 (19%) indicated that they had a problem with the wristband. Of the 14 lone participants who provided feedback, 3 (21%) indicated that they had a problem with the wristband. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that they had a problem with the wristband.

In postexperimental surveys and interviews, some of the participants reported having concerns about forgetting to wear the Fitbit device, or reported forgetting to wear the Fitbit device during the experience. This included participants like Case #09 (lone participant), who wrote, “I wondered if I’d remember to put on the Fitbit everyday…” or Case #10 (lone participant), who wrote, “I had a hard time remembering to wear my Fitbit, which is why fitbits [sic] haven’t really worked for me in the past.”

Figure I-12

Device Feedback



Note. Feedback from participants regarding the Fitbit device, segmented by participant pool.

Of the 31 total participants who provided feedback, 8 (26%) indicated that they had concerns about forgetting to wear the device or experienced difficulty remembering to wear the device. Of the 14 lone participants who provided feedback, 4 (29%) indicated that they had concerns about forgetting to wear the device or experienced difficulty remembering to wear the device. Of the 17 cohesive group unit members who provided feedback, 4 (24%) indicated that they had concerns about or experienced difficulty remembering to wear the Fitbit device.

In postexperimental surveys and interviews, some of the participants reported worrying about remembering to charge the Fitbit device, or reported forgetting to charge the Fitbit device during the experiment, or reported other frustrations related to charging the Fitbit device. This included participants like Case #08 (group member), who when

asked what was most frustrating about participating responded, “Charging the Fitbit,” or participants like Case #34 (group member), who wrote, “…I did forget to charge it a few times.”

Of the 31 total participants who provided feedback, 4 (13%) indicated that they had frustrations or worries related to charging or remembering to charge the Fitbit device. Of the 14 lone participants who provided feedback, 1 (7%) indicated that they had frustrations or worries related to charging or remembering to charge the Fitbit device. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that they had frustrations or worries related to charging or remembering to charge the Fitbit device.

In postexperimental surveys and interviews, some of the participants reported experiencing technical difficulties related to the Fitbit software, including connectivity issues and issues with the device syncing. This included participants like Case #15 (group member), who wrote “…the Fitbit not syncing automatically was kind of frustrating.” Of the 31 total participants who provided feedback, 5 (16%) indicated that they experienced technical difficulties related to the Fitbit software. Of the 14 lone participants who provided feedback, 2 (14%) indicated that they experienced technical difficulties related to the Fitbit software. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that they experienced technical difficulties related to the Fitbit software.

In postexperimental surveys and interviews, some of the participants indicated that they already owned and used a wearable fitness tracker, and some disliked having to simultaneously wear redundant devices. Case #34 (group member) said, “I wear another fitness tracker normally, so wearing both was more cumbersome than I originally

thought, but it wasn't too bad." Of the 31 total participants who provided feedback, 3 (10%) mentioned wearing two devices. None of the 14 lone participants who provided feedback mentioned wearing two devices. Of the 17 cohesive group unit members who provided feedback, 3 (18%) mentioned wearing two devices.

In postexperimental surveys and interviews, two of the participants (6%) made additional negative statements about the Fitbit hardware, outside of those mentioned above. One of the 14 lone participants (7%) mentioned that the device was easy to misplace. One of the 17 cohesive group unit members (6%) mentioned that they didn't like wearing the Fitbit device, because it fell off easily and was sometimes obtrusive.

In postexperimental surveys and interviews, some of the participants made positive statements about the Fitbit device, including that they liked wearing an activity tracker, that they found it easy to remember to charge and wear, that it was convenient, and that it worked well. Of the 31 total participants who provided feedback, 9 (29%) made positive statements about the Fitbit device. Of the 14 lone participants who provided feedback, 5 (36%) made positive statements about the Fitbit device. Of the 17 cohesive group unit members who provided feedback, 4 (24%) made positive statements about the Fitbit device.

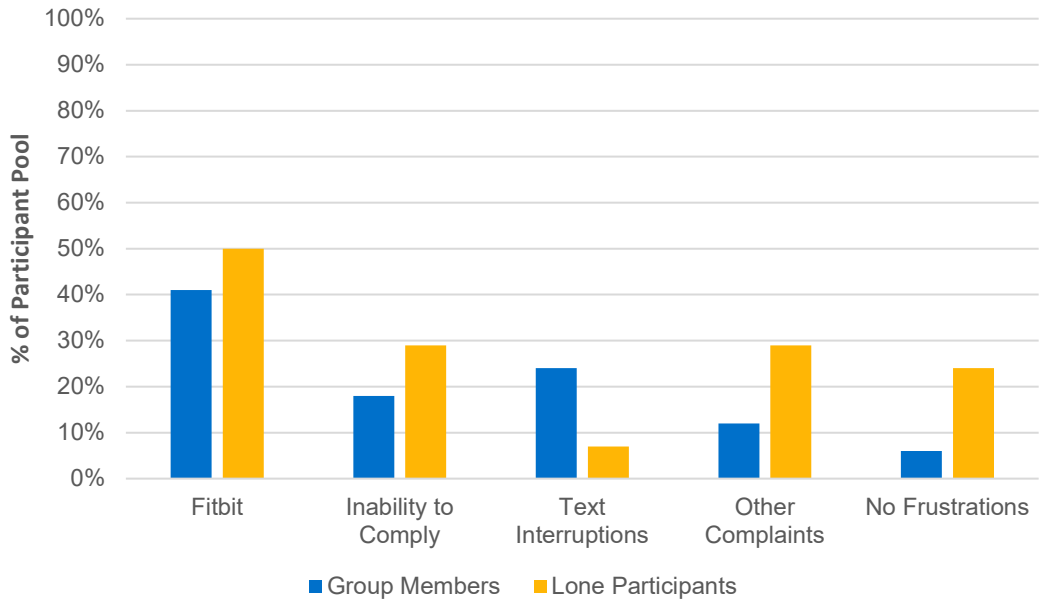
Frustrations

In postexperimental surveys and interviews, some participants described frustrations they experienced related to their participation (see Figure I-13). Participants reported being frustrated by the device software or hardware, not being able to walk when they received the texts, the texts being interruptions, and other solitary, individual

issues. Some of the participants reported experiencing no frustrations related to the experiment.

Figure I-13

Participant Frustrations



Note. Frustrations reported by participants, segmented by participant pool.

Negative feedback about the Fitbit included hardware complaints from participants like Case #18 (lone participant), who wrote, "Wearing the bracelets is annoying, there should be a [sic] easier way to collect info," and software complaints from participants like Case #26 (lone participant), who wrote that the most frustrating aspect of the experience was "[t]he technical issues." Of the 31 total participants who provided feedback, 14 (45%) indicated that they experienced frustrations related to the Fitbit device hardware or software during the experiment. Of the 14 lone participants who provided feedback, 7 (50%) indicated that they experienced frustrations related to the

Fitbit hardware or software. Of the 17 cohesive group unit members who provided feedback, 7 (41%) indicated that they experienced frustrations related to the Fitbit hardware or software.

Frustrations about inability to comply with the text activity prompts came from participants like Case #19 (lone participant), who when asked what was most frustrating about their experience wrote, “Not being able to walk if I was busy, which was a lot. I also got frustrated with myself for ignoring the notifications as I got used to the timing.” Of the 31 total participants who provided feedback, 7 (23%) indicated that they were frustrated by their inability to comply with the text reminders. Of the 14 lone participants who provided feedback, 4 (29%) indicated that they were frustrated by their inability to comply with the text reminders. Of the 17 cohesive group unit members who provided feedback, 3 (18%) indicated that they were frustrated by their inability to comply with the text reminders.

When asked about the most frustrating aspect of the experience, some participants complained about the texts interrupting them. Case #16 (group member) wrote, “A few times when I was really busy, the texts were distracting and annoying but I don't think it was the fault of the experience.” Case #21 (lone participant) reported the most frustrating aspect of the experience was that “[s]ometimes the text messages would come at very inconvenient times and that would be annoying.”

Of the 31 total participants who provided feedback, 5 (16%) indicated that they were frustrated by the text reminders interrupting them or distracting them when they were busy. Of the 14 lone participants who provided feedback, 1 (7%) indicated that they

were frustrated by the text reminders interrupting them or distracting them when they were busy. Of the 17 cohesive group unit members who provided feedback, 4 (24%) indicated that they were frustrated by the text reminders interrupting them or distracting them when they were busy.

The remainder of the responses to the question asking participants what frustrated them most were unique. Unique frustrations from the lone participants included complaints about the wording of the text reminders being annoying, the lack of interaction and socialization in the experiment, the inability to explore and customize the app, and the inability to check how many steps they had taken. Unique frustrations from the group members included not always wanting to go on walks when they received the text reminders and realizing that they were more influenced by peer pressure than their own desire to be healthy.

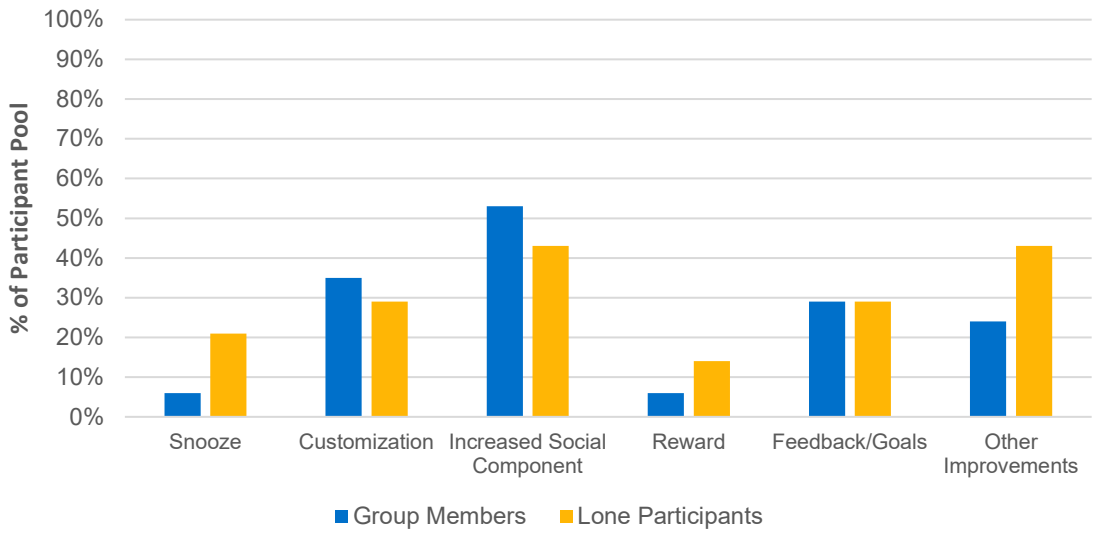
Some of the participants reported that they were not frustrated by any aspect of the experiment. When asked what was most frustrating about their experience, Case #06 responded, “I never really got frustrated with anything.” Of the 31 total participants who provided feedback, 3 (10%) indicated that they experienced no frustrations related to their participation in the experiment. Of the 14 lone participants who provided feedback, 2 (14%) indicated that they experienced no frustrations related to their participation in the experiment. Of the 17 cohesive group unit members who provided feedback, 1 (6%) indicated that they experienced no frustrations related to their participation in the experiment.

Improvements

In postexperimental surveys and interviews, participants were asked what changes could be made to the intervention that would make it more effective at increasing their step count (see Figure I-14). Participants recommended the addition of the ability to temporarily delay or “snooze” text prompts, customizable or calendar-based text reminder delivery times, an increased social component, goal-setting and system feedback, rewards, and other individual, solitary recommendations for improvements.

Figure 21

Recommended Treatment Improvements



Note. Suggestions from participants on how to improve treatment efficacy, segmented by participant pool.

In postexperimental surveys and interviews, participants indicated that adding the ability for participants to temporarily delay, or "snooze," individual text reminders would have increased the treatment's efficacy in regard to step count. This included Case #19 (lone participant), who wrote, “Snoozing the reminder [would improve

efficacy]…putting it off just a little bit so I didn't just forget about it." Of the 31 total participants who provided feedback, 4 (13%) recommended adding the ability to snooze reminders. Of the 14 lone participants who provided feedback, 3 (21%) recommended adding the ability to snooze reminders. Of the 17 cohesive group unit members who provided feedback, 1 (6%) recommended adding the ability to snooze reminders.

In postexperimental surveys and interviews, participants indicated that adding customization of text reminder delivery times would have increased the treatment's efficacy. Participants described the ability to personally edit delivery times, as well as the option of having automatically setting dynamic delivery times based on their availability as indicated in their calendar software. Case #29 (group member) suggested the treatment should "[g]ive me more control over when and how often I receive reminders" in order to improve efficacy. Case #18 (lone participant), recommended offering "[p]ersonalized times for the reminders to be sent, based on the persons [sic] schedule, to give maximum chance for success."

Of the 31 total participants who provided feedback, 10 (32%) indicated customized text reminder delivery times would have increased the treatment's efficacy. Of the 14 lone participants who provided feedback, 4 (29%) indicated customized text reminder delivery times would have increased the treatment's efficacy. Of the 17 cohesive group unit members who provided feedback, 6 (35%) indicated customized text reminder delivery times would have increased the treatment's efficacy.

In postexperimental surveys and interviews, participants indicated that the addition or amplification of a social or competitive component would have made the

treatment more effective. Case #01 (group member) wrote, “For me personally a competition…would increase my distance,” and Case #08 (group member) wrote, “It be cool If [sic] companies started implementing walk sessions where they invite co workers [sic] to go on a 20 minute walk each day during work.” When asked how to increase efficacy, Case #28 (lone participant) said, “you could make it competitive with your friends or coworkers or something where you had…some incentive to do it beyond text message…if we were all in the same study, then yeah, I'd probably be more incentivized to get all the steps in…Probably just because you don't want to be the one that's not walking around if everybody's in the same study. Peer pressure.”

Of the 31 total participants who provided feedback, 15 (48%) recommended adding or amplifying a social or competitive component to the treatment. Of the 14 lone participants who provided feedback, 6 (43%) recommended adding or amplifying a social or competitive component to the treatment. Of the 17 cohesive group unit members who provided feedback, 9 (53%) recommended adding or amplifying a social or competitive component to the treatment.

In postexperimental surveys and interviews, participants indicated that the inclusion of goal-setting and system feedback would have improved treatment efficacy. Case #21 (lone participant) suggested that “[p]roviding information about how much I have walked already would help” make the treatment more effective. Case #31 (group member) recommended “[h]aving goals and targets” to increase efficacy. Of the 31 total participants who provided feedback, 9 (29%) recommended including goal-setting or system feedback in the treatment. Of the 14 lone participants who provided feedback, 4

(29%) recommended including goal-setting or system feedback. Of the 17 cohesive group unit members who provided feedback, 5 (29%) recommended including goal-setting or system feedback.

In postexperimental surveys and interviews, participants indicated that the inclusion of a reward or incentive would have made the treatment more effective. This included participants like Case #04, who suggested that "some kind of reward for other people's progress which would encourage both of you to reach out to each other and walk or exercise together" could improve efficacy. Of the 31 total participants who provided feedback, 3 (10%) recommended including a reward or incentive in the treatment. Of the 14 lone participants who provided feedback, 2 (14%) recommended including a reward or incentive. Of the 17 cohesive group unit members who provided feedback, 1 (6%) recommended including a reward or incentive.

The remainder of the responses from participants when asked what changes might improve the treatment's efficacy were unique. Individual improvements recommended by the lone participants included more frequent text reminders, delivering text reminders via the Fitbit device, using a method less annoying than a Fitbit wearable for collecting data, randomizing the text reminder delivery times, mood tracking, and increasing participant motivation. Individual improvements recommended by the cohesive group unit members included using a less obtrusive wearable, sending text reminders outside of work hours, adding motivational memes, prompting movement during periods of inactivity, and sending reminders via Slack.

Appendix J

Interview Excerpts

Interview Excerpts

Efficacy

The postexperimental interview with Case #02 is representative of the perceived efficacy that was more common among group member participants. In the following excerpt from their interview, they initially mention how their awareness of being monitored affected their behavior.

Case #02: [Wearing the Fitbit was] fine though because later on I started to see the benefit, that it was keeping track of my steps. And even though I wasn't allowed to see my steps, I knew it was counting it. So there was times where I was like, “Well, I could get water from upstairs or I could get water from downstairs,” but because I felt like somebody was tracking me, I was going a little bit further. So it, maybe it motivated me even though I wasn't really tracking my own steps, I wasn't trying to break my own record, but I just felt like somebody was watching me, and I was trying to put more steps in. And I think throughout that period during the study, I don't think I'm missed—I might have missed like three days from my regular morning run that I do, and I haven't done that for a while now. So maybe I should participate in more of your studies.

Researcher: That's interesting. So the idea of just being observed or being tracked, that influenced your behavior?

Case #02: Yes. A lot.

They continued, describing their typical experience receiving an activity prompt.

Case #02: Emotion-wise I was excited, because it kind of pulled me away from whatever I was doing, and sometimes you tend to get swamped with working. You don't tend to look up and try to do—step away for a bit. And getting those text messages was great, because it gave me an excuse of saying, “Okay, well, I gotta do my walk." And that kind of, kind of unplugged me a little bit from work just to unwind a little bit and and come back again. Typically, I'll be at my desk, and then I'll get text messages. And that would just kind of let me be able to unplug for a little bit and just walk. And that was just—it felt good coming back to that.

Researcher: Do you think the messages affected your behavior?

Case #02: Absolutely.

Researcher: And how much did it make you walk each day, do you think?

Case #02: I think at least from five to 15 minutes, or maybe more.

In a postexperimental interview with Case #02, a lone participant, they described the effects of the treatment as limited:

Researcher: What was your experience like?

Case #02: Honestly pretty neutral. It was interesting having the Fitbit on and getting the texts, but I don't know that it really had much of an impact on me.

Researcher: Why do you think that was? Why didn't it have an impact on you?

Case #02: My guess is probably there wasn't really any reinforcement. It was like, all right, you're gonna get a text, what, twice a day or so? But because it happens during work hours it's kind of something that I could just look at and then ignore.

Researcher: Did it ever make you walk?

Case #02: I think there were a couple times where I got the text and I was like, all right, I will at least go outside and walk around the building and then go in. So a few times, but I don't think it was it was enough to you know, make me fit or anything…I don't think it had a big impact.

Researcher: How many times do you think you actually walked because of it, total?

Case #02: Because of it? I would say like maybe three or four.

In a postexperimental interview with Case #28, another lone participant, they also described the treatment effectiveness as limited:

Case #28: I don't know if it necessarily would change my behavior, but it

would make me think about it more than I would have, if that makes sense. I maybe would have some guilt or something, knowing that I should be doing that, but wouldn't maybe necessarily change my behavior.

Researcher: So do you think it impacted your walking at all?

Case #28: Yeah, I think, yeah, maybe a little, maybe a little bit just knowing like, "Oh, I should be doing that." But I don't think drastically, maybe a few times on days where I was like, "Oh yeah, I want to do that"…usually I was in the middle of something…or you know, I've got a chore to do or something like that, I need to do it but something came up.

Researcher: Overall, if you had to estimate how many times during the study you think that your number of steps per day was influenced, could you ballpark that?

Case #28: Probably maybe three or four days, five maybe, the whole time.

Efficacy Fluctuations

In the postexperimental interviews, all three lone participants described the efficacy of the treatment declining over time. Case #22 (lone participant) said,

> I was excited the first time I got a notification, and I was able to get up and walk around. But then my job kind of got increasingly—my workload got increasingly heavy over that time. I think I walked more the first couple weeks.

In their post-intervention interview, Case #27 (lone participant) described a decline in efficacy as well. When asked if their reaction to the activity prompts changed over time, they said, "I think if anything I got desensitized to them and started ignoring them probably. In the same way you do with, you know, annoying notifications that you can't turn off from your bank or whatever. You just start ignoring them."

In their postexperimental interview, Case #28 also described the treatment's

efficacy as declining over time:

> Researcher: Was there a difference from the beginning of the study towards the end of the study?
>
> Case #28: Yeah, I think as time progressed then [walking] became less and less in the forefront of my mind.

In the postexperimental interviews, all three group member participants described the efficacy of the treatment as being consistent over time. When asked if their response to the texts changed over time, Case #07 (group member) said, “I think that was pretty consistent.” Case #13 (group member) indicated consistent efficacy as well:

> Researcher: Did that change over time? Or was that consistent throughout the study?
>
> Case #13: I'd say it was consistent the whole time.
>
> Researcher: Did you notice any sort of difference in your behavior or the experience of getting the text from the beginning to the end?
>
> Case #13: Not that I remember.

Case #02 also described the treatment as consistent in efficacy in their postexperimental interview:

> Researcher: Did any of that change over time? Was there a difference at the beginning versus the end?
>
> Case #02: No, I think I was pretty consistent in doing it. I was—I know there's a couple of days I missed, but I missed only because I was in meetings. But I don't think it changed.

It is notable that the one respondent who reported an increase in efficacy was Case #30, a cohesive group unit member who specifically cited their coworkers’ influence as the cause, stating, “It only changed over time as my colleagues became more insistent on walking.” Overall, the participant interview and survey responses support the

hypothesis that group membership may be a factor in treatment efficacy.

Social Support and Peer Effect

Case #02, a group member, described their experience with social support and peer effect during their postexperimental interview. They discussed how walk duration increased when they were accompanied by another participant, and how other group member participants acted as supporters and reminders during the experiment.

> Case #02: I think [walk duration] would depend on who I was with. If I was walking with somebody else, or if I was just doing it by myself. If I was doing it by myself, I was just going downstairs, it would be the shortest walk. But if I was walking with somebody else in our floor up here, then it will tend to be a little longer walk.
>
> Researcher: On that note, what kind of social support did you have? Family or coworkers or peers or other people?
>
> Case #02: Yeah, [coworker's name redacted]. [Coworker's name redacted] would just look over, you know be like, "Are you ready for your walk?" and I'd be like, "Yep, let's do this." That, he was my support over here...You know what, a few times that I missed my text messages was because I was focused on my work...that's almost the reason why it kind of helped that I had [coworker name redacted] next to me, because he would remind me. Because there was a lot of times where I wouldn't even see my phone, and he would remind me that we got a text, that's what would get me going.

When asked if there were other benefits to participating as a group, Case #02 described how feeling obligation toward the group unit impacted their walking habits, and the positive effects of peer pressure as a motivator.

> Researcher: Aside from the fact that [coworker name redacted] would remind you, do you think that there was a benefit to the social component?
>
> Case #02: Absolutely. If it was a group thing where everybody was getting notified in Slack to walk together, that would be a thing that I wouldn't miss, because in the back of your mind, you almost feel like

> it's a group thing, right? It's a team effort and you don't want to let your team down. So even though they probably wouldn't care, but, it just seems like a team effort. A way to maybe talk with your co-workers in that kind of atmosphere. It's really helpful...[Coworker participation] affected me in keeping myself on track. Because it was, it would be easy for me to ignore the text messages and just, you know, nobody knows why I just got a text message, it's fine, nobody cares. But if other co-workers are getting the same message I'm getting, then it kind of motivates me to get up and actually do the walk with them. And again, it's like a whole group thing, right? It's a group activity. So it's not just something you do by yourself, which wouldn't be that bad either. Right? And a couple times, I did do it by myself. But it's more of like not letting everybody else in the team down and doing it as a group activity.

Case #07 (group member) also described the social support they received and the effect it had on their walking habits, mentioning that coworker participation acted as a reminder and made taking walks more enjoyable.

> Case #07: It was super helpful to realize that people around me were going for a walk. I'm like, "Oh, yeah. check my phone. Oh, yeah, a text came. Let's go!" That was really cool. Especially for someone like me who isn't watching their phone. To see other people getting up and like, “Oh!” That was a good cue.
>
> Researcher: Last question is, can you tell me how being around other people getting the text message influenced you?
>
> Case #07: Yeah, like if I saw people in response to that, it made it a lot more enjoyable because it's fun to go walk with people, as a social break, not so much a mental break, right? It'd be more fun to go walk with people then walk by myself.

Postexperimental group member survey respondents reported the reception of social support from peers and the positive effect that had on their step count and walk enjoyment. Case #08 (group member) reported,

> It was nice having co-workers close by that also got the texts. Usually we’d go on our walks together. At first the texts were working, as soon as I got the text I’d turn to my coworker to see if they wanted to go on a walk and we usually did.

When asked if they received any social support that helped encourage them, Case #08 reiterated, “Coworkers. As stated earlier, we’d usually turn to each other to see who wanted to go on a walk.”

In their postexperimental survey response, Case #30 (group member) described their social support and its effect on their walking habits:

> For the most part I ended up ignoring the texts or being snarky with the reminders unless my coworkers asked me to join them. Peer pressure was a stronger factor than the reminders. It felt like the texts I get for other reminders like sales or political action, which I'd mostly put to the side and forget. I only followed it if my colleagues told me they were going walking. It only changed over time as my colleagues became more insistent on walking. My colleagues are the only ones that would mention it. It was fun to walk with them. I felt slightly dumb and awkward doing it by myself.

When asked about social support in the postexperimental survey, Case #33 (group member) described the amplifying and dampening effects of peer behavior, writing, “I just noticed that some of my coworkers were still on the plan, and that encouraged me to remember I was doing it as well. And when other co-workers ignored it, I tended to ignore it too.” Case #16 (group member) described how coworker participation increased their mindfulness of walking, writing “I saw people in the office going for walks when they got the text messages which did keep the idea of going for a walk fresh in my mind.”

Participants also described how group participation and social support made their experience more enjoyable. When asked what was most enjoyable about participating, Case #31 (group member) responded, “The interaction with coworkers that were also involved :),” and Case #029 (group member) responded, “The social experience of walking with peers.” Case #30 reported the most enjoyable aspect was “[g]etting to chat

with my colleagues as we walked together," adding, "It was fun to walk with [my coworkers]."

If, as participants suggest, social support increases walk enjoyment and treatment efficacy, and group members were more likely to have social support, then group dynamics may have been a contributing factor in the step count differences seen between group members and lone participants.

It is notable that the majority of the lone participant respondents who described themselves as possessing social support were referring to support from family members. Limiting the responses to mentions specifically of support from coworkers or peers turn the mentions of social support among lone participants and group members to 7% and 53% respectively. If social support does impact efficacy, the difference between behavior of the participant types may have been more distinct had lone members not had the support from their families.

Case #24 (lone participant) reported their lack of social support in the postexperimental survey, writing,

> I did not [have social support], and would have liked to have a work friend be given the same challenge. Or make it a team activity, time permitting. I think I could have engaged friends and family outside of work to assist me with walking (or other exercise), but I usually have such little energy to commit. [What frustrated me most was] Lack of ability to interact, I think...And yeah, not really being able to grab a friend to accompany me.

Case #09 (lone participant) also discussed the desire for social support and its potential effects on the treatment's efficacy.

> Unfortunately no [I did not have social support]. In the past this has been the single element that has made the most difference in my fitness. When I had a group of guys depending on me to come and play ball, or a workout buddy at the

gym, I was exponentially more consistent and my workouts were always better. [To increase efficacy, add] a social accountability component. Technology is great for reminding, "intervening" as you called it, and great for gathering and reporting on data. But technology lacks a motivating force. That needs to come internally from a person, or externally from positive social pressure. Without that component, technology becomes a nuisance and ultimately does more harm than good because it's a constant reminder to a person that they lack the motivation to improve themselves.